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COMPUTERWORLD

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IBM quietly fortifies embattled VSE

By Paul Gillin
CW Staff

WHITE PLAINS, N.Y. — IBM has quietly unveiled a series of major enhancements to its VSE/System Package. The announcement constitutes what observers agree is the biggest boost IBM has given its beleaguered DOS operating system in several years.

Among the highlights of VSE/SP 2.1.0 are a consistent interactive interface, the extension of virtual support from 16M bytes to 40M bytes, an enhanced librarian and conditional JCL. The updated system also provides support for networked IBM Personal Computers within the DOS/VSE environment.

As part of the release, IBM also unveiled enhancements to VSE/Interactive Computing and Control Facility, VSE/Power and Advanced Communications Function/Vtam (story on page 8). VSE/SP 2.1.0 will be available in April 1985.

The interactive interface makes VSE/SP base components and some additional system services available to all users under a unified command structure that can also be tailored to the individual user, IBM said. The interface is a consistent set of function lists, dialogues, Help facilities and selection and data entry panels. The features are useful in the areas of system administration, operation, application development and end-user access, a spokesman said.

Next week's In Depth takes a hard look at what VSE/SP 2.1.0 means for users.

Installation support has been improved so that the pregenerated system is delivered on two distribution tapes and reportedly can be installed in about two hours. Faster problem diagnosis is possible through fixed system layout and on-line problem determination, IBM said. On-line problem determination aids are provided for IBM CICS users, and Help facilities have been added.

Networking and distributed data processing support was also enhanced. VSE/SP 2.1.0 allows cross-domain logon from other systems having ACF/Vtam or ACF/

See **DOS/VSE** page 8

Ownership of software package at issue

If jointly installed, does it belong to consulting firm? Or firm's client?

By Jeffry Beeler
CW West Coast Bureau

SAN FRANCISCO — A small consulting firm and a huge U.S. bank are locked in a bitter legal battle over which owns a prized software module that the two organizations jointly adapted to the financial institution's existing systems.

Both Tinmahan Consultants, Inc. and the giant Bank of America claim to be the exclusive owner of the proprietary software, which the consulting company installed while working under contract for Bank of America.

Gulab Tinmahan, the consulting firm's president, said he wrote the On-Line Menu-Driven System years before he began merging the software into Bank of America's electronic funds transfer network.

Last February, six months after his association with the bank abruptly ended, Tinmahan requested a preliminary injunction to force the bank to cease using OLMDS and return the code. The injunction would also order the bank to stop hiring Tinmahan's programmers and, thus, inducing them to breach their employment agreements with him.

If the injunction is executed and Tinmahan posts the necessary bond, the Bank of America will furnish the consultant with a copy of all the disputed OLMDS software, except for the system's security programs, according to a bank attorney.

Under the proposed injunction, each side would be permitted to use its respective copy of OLMDS as it sees fit, but would be forbidden to "waste or destroy" the system, the Bank of America lawyer said during an interview.

For the moment, though, the bank retains complete control over both its OLMDS object code and, far more important, the only copy of the system's indispensable source code, according to Tinmahan's attorney, Richard Jones.

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Subbing in new players: Honeywell, Inc. retired three older members of its DPS 7 lineup, but brought in three replacements. **Page 2.** Prime Computer, Inc. enlarged its supermini roster with a mid-range model. **Page 4.**

■

If you ignored the April 16 deadline for income tax filing, expect a call from the Internal Revenue Service — a call initiated by a computerized collection system. **Page 5.**

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The Department of Defense lengthened its wish list of export controls on high-tech items to include commercially available microcomputer and mainframe software. **Page 7.**

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Don't give them shelter, federal authorities said as they halted promotion of a tax shelter involving the sale of hardware and software. **Page 12.**

■

FYI

'Age machine' evolves from artist's idea

By David Olmos
CW Staff

NEW YORK — Nancy Burson, a New York artist, had a most unusual idea about 15 years ago: What if, by using a computer-generated art process, a person could see what he would look like in 10, 20 or even 50 years?

Newton, age 4

Photos courtesy of N. Burson

Artist's update, age 12

Today, after years of effort, what began as an artist's crazy idea has become a marketable reality.

Burson holds the patent on The Method and Apparatus for Producing an Image of a Person's Face at a Different Age, an involved method of simulating the aging process through computer graphics. The age machine, as Burson calls it, produces a composite photograph of the aged person.

Burson worked with scientists at MIT during the late '70s to develop the invention. "This was one of the first times a computer had interacted with a live image," she said, explaining the university's interest in her project. So far, the method has, among other things, been used to help law enforcement officials identify what a kidnapping victim might look like years after his disappearance.

Burson hopes someday to use her invention for a "participatory video" application in which a person looking in a window could actually see himself aged. "My work deals a lot with the different aspects of perception. And this [aging] is basically how we perceive ourselves," said Burson, whose other artistic endeavors include painting, drawing and video production.

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NEWSPAPER

NEWS

Honeywell replaces three DPS 7 models

By Tom Henkel
CW Staff

WALTHAM, Mass. — Honeywell, Inc. has replaced three members of its DPS 7 line of low-end mainframes with E series models that offer roughly the same internal performance as their predecessors, but carry price tags that are 10% to 21% lower.

Announced last week were the DPS 7/45E, the DPS 7/55E and the DPS 7/65E. The first member of the E series, the entry-level DPS 7/35E, was announced early last summer [CW, July 4].

The latest E series processors are said to incorporate features that make them easier to use in conjunction with Honeywell's older Level 62 mainframe processors. Those features include a mass storage processor that supports the firm's 80M-byte MSU0330/1 and 300M-byte MSU0390 disk drives, which previously ran only on the Level 62 and DPS 7/32E. The mass storage processor expands the E series' mass storage capacity to a maximum of 20G bytes, a spokesman said.

Other features added to the E series line include a tape adapter that supports up to four 9-track, 1,600 bit/in. tape units that can operate at 45 or 75 in./sec; a switch to newer technology 64K-bit memory chips; and a switch from copper to gold connectors on printed-circuit boards.

The E series processors are compatible with Honeywell's Gcos operating system and all peripherals developed for the DPS 7 line, Honeywell said. The company will no longer market non-E models of the DPS 7.

While the spokesman said it is possible for users of DPS 7 systems to upgrade to the E series, he also said that such a move would be necessary only for those users whose applications have to run on the Level 62 mainframes.

Users of the non-E model DPS 7s will have to pay more than users of the E series models to upgrade. The upgrade charges are basically the difference between the purchase prices of the different models of processors, according to the spokesman.

For example, it costs $21,800 to upgrade from a 7/35E system (with a purchase price of $82,200) to a 7/45E, which carries a $107,000 price tag ($21,000 less than its DPS 7/45 predecessor). A user of a non-E model would pay $34,500 for a similar upgrade.

The 7/55E is priced at $158,000, $43,600 less than the non-E model, and the DPS 7/65E costs $215,700, $40,000 less than the DPS 7/65, the spokesman said.

Additional information on the E series models is available from Honeywell, which is headquartered at 200 Smith St., Waltham, Mass. 02154.

DPS 7 software bundled up

WALTHAM, Mass. — Besides announcing three additions to its E series of DPS 7 processors last week, Honeywell, Inc. also unveiled software that bundles together DPS 7 data base management and transaction processing products and cut prices on some manufacturing-oriented software for the DPS 7 line.

The Data Management 7 (DM 7) package is a bundled version of several Honeywell program products: Integrated Data Store/II, a Codasyl-compliant data base management system; Data Base Administrator Aids; the Transaction Driven System, a transaction processing package; the Form Management Utility; and the DM 7 Query Processor.

DM 7, which Honeywell said costs 25% less than the total of all five programs if purchased separately, comes in two versions. DM 7 is for users of Honeywell's Gcos operating system and costs $809. DMS 7-ES, for the DPS 7/35E and 45E processors, delivers the same functions as DM 7, but uses the transaction processing capabilities provided by Honeywell's Gcos Entry System; it costs $492.

Honeywell announced price cuts up to 40% on modules of its Honeywell Manufacturing System (HMS 7) software for the DPS 7. HMS 7 provides integrated management control of inventory and production operations.

Initial module license fees are $8,400 for Inventory Record Management; $16,800 for Manufacturing Data Control; $16,800 for Material Requirements Planning; $16,800 for Master Production Scheduling; $8,400 for Statistical Forecasting; and $16,800 for Capacity Requirements Planning. Monthly lease terms are also available, the firm said from 200 Smith St., Waltham, Mass. 02154.

ATMs declared branch banks by federal judge

By James Connolly
CW Staff

ROCHESTER, N.Y. — A national bank need not own or rent an automated teller machine for that ATM to be considered a branch bank and therefore subject to state and interstate banking laws, a federal court judge ruled here recently.

Any ATM used by a bank to accept deposits or dispense cash should be considered a branch bank, said U.S. District Judge Michael A. Telesca.

Telesca's ruling, which went one step beyond the U.S. Comptroller of the Currency's opinion that an ATM is a branch if a bank owns or rents it, came in a dispute between the $160 million Canandaigua National Bank and Trust of Canandaigua, N.Y., and Wegmans Food Markets, Inc. and Marine Midland Bank, N.A.

Canandaigua National Bank and the Independent Bankers Association of New York State, Inc. last year sued Marine Midland and Wegmans, charging that an ATM at a Wegmans supermarket in Canandaigua violated the 1927 McFadden Act, which regulates banks, and New York's home office protection law, which bars outside banks from opening branches in small cities that are headquarters for banks.

The ATM at issue was owned by Wegmans. However, the cash and reconciliation was handled by Buffalo, N.Y.-based Marine Midland, whose customers could use bank cards to deposit and withdraw funds. The ATM was linked to the Harmoney network, in which Marine Midland is a participant.

Telesca, noting that the customers' probable impression was that they were dealing with a bank rather than a store despite Wegmans' ownership of the machine, barred Marine Midland from using the ATM. Telesca also denied Canandaigua National's claim that Wegmans was illegally engaged in banking.

George W. Hamlin IV, president of both the Canandaigua bank and the Independent Bankers Association, said the barring order has the effect of keeping other nationally and state chartered banks from using the ATM at Wegmans, where his bank has one of its six branches. He said only credit unions and federal savings and loan institutions, which are exempt from the McFadden Act, may use the Wegmans ATM.

Marine Midland, which has until May 12 to decide whether to appeal Telesca's ruling, had countered the unfair competition argument by charging that the local bank held an unfair advantage. But Telesca, noting that it is Congress' job to address the competition argument and to update the over 50-year-old McFadden Act, said the law doesn't insure "perfect equality" between banks.

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NEWS

Prime unveils compact supermini for office use

Mid-range processor claims up to 80% more power than entry-level Series 50

By Tom Henkel
CW Staff

NATICK, Mass. — Prime Computer, Inc. last week expanded its Series 50 line of 32-bit superminicomputers with the Model 2550, a mid-range processor that offers up to 80% more processing power than the firm's entry-level 2250 supermini and occupies roughly half the space of its top-of-the-line 9950.

The 2550 replaces Prime's older 32-bit 250II processor and offers internal performance that is roughly 10% greater than the mid-range 550II processor. The 550II, however, supports a higher disk storage capacity than the 2550, a spokeswoman noted.

The 2550 occupies two cabinets, each about the same size as a two-drawer filing cabinet. It can operate in either a computer room or an office environment, Prime said.

Higher circuit density

According to a spokeswoman, the 2550 incorporates a higher circuit density than earlier Prime products and also incorporates custom gate array circuits, which help reduce the unit's size.

Like the firm's high-end 9950 processor, the 2550 features 16K bytes of cache memory, a standard floating-point processing capability and a diagnostic processor.

In an office environment, the unit features 2M to 4M bytes of main memory and support for up to 315M bytes of fixed disk storage, streaming tape drives and the firm's Intelligent Communications Subsystem II.

When it is used in a computer room, higher capacity disk drives, including Prime's top-of-the-line 675M-byte Winchester disk subsystem, can be added.

To back up stored data, the 2550 supports Prime's 75 in./sec, 1,600 bit/in. tape subsystem or Prime's 1,600/6,250 bit/in. group code recording tape drive.

In addition, the 2550 supports all Prime communications controllers and a variety of printers.

The 2550 runs under the firm's Primos operating system and is compatible with software developed for other Prime systems. In addition, the 2550 can use Primenet to communicate with other Prime terminals and systems and processors developed by other vendors.

The 2550 is compatible with the smaller 2250 and 250II processors, but users cannot convert their older processors into the newly announced CPU.

Instead, Prime is offering a CPU credit program in which users can swap their currently installed CPUs for the 2550. The credit that users receive decreases over time; users with processers installed less than one year receive a 100% CPU rebate.

Trade in to upgrade

For example, the 2550 CPU costs roughly $61,000. A 2250 user who has had his processor for less than a year would receive a $12,000 credit in exchange for his 2250 processor. In that case, the upgrade cost from a 2250 to 2550 processor would cost $49,000, according to the vendor spokeswoman.

A basic 2550 configuration consisting of a CPU, 2M bytes of main memory, 16K bytes of cache memory, a 315M-byte fixed media disk drive, a 1,600/3,200 bit/sec streaming tape drive, a Prime PST100 console and a diagnostic processor costs $99,500.

First shipments of the processor will begin in May, the vendor said from Prime Park, Natick, Mass. 01760.

PRIME COMPUTER, INC.

System Characteristics	Series 50 2250	Series 50 2550	Series 50 550II
Relative Performance[1]	30	42	38
Mips[2]	.47	.73	.67
Memory Size in Bytes (Minimum-Maximum)	512K-4M	2M-4M	1M-4M
Purchase Price[3] (Memory Size)	$39,900 (512K)	$99,500 (2M)	$111,000 (1M)
Lease Price (Lease Term)	$909 (5 Year)	$2,264 (5 Year)	$2,503[4] (5 Year)
Machine Cycle Time (Nsec)	160	160	160
Channels[5] (Minimum-Maximum)	4	1-8	10
Cache (Buffer) Size	2K	16K	8K
Bus Architecture?	No	No	No
Price per 1M Byte[6] Of Main Memory	$10,500	$10,500	$10,500

1. CW estimates based on vendor-supplied information. Relative performance ratings are based on an IBM 370/158-3 equaling 45. These numbers are designed to put the processor into perspective with other systems; they do not constitute a buyer's guide. All systems are not alike; they use different operating systems, instruction sets and architectures and, therefore, cannot be directly compared. In addition, actual relative performance may vary with the application, peripherals and software.
2. Vendor claims.
3. Includes processor, console, power supply and all prerequisites.
4. Includes PST100 CRT console.
5. Available I/O chassis slots excluding those dedicated to CPU memory guards.
6. Purchase price for add-on memory.

CW chart

AGE from page 1

The age machine is based on the premise that people's faces generally age in the same places, mainly in the eyes and mouth, Burson said. There is a finite number of typical aged faces, for example, fat men, thin men, fat women and thin women. In each of these categories there are certain characteristics that change in almost all faces of a given type, according to the premise.

Photographic composites of movie stars

Photos courtesy N. Burson

Simulation process

In order to simulate the aging process, a picture of an old face and a corresponding young face are recorded using a vidicon camera, digitizer and digital computer. Burson now uses a Digital Equipment Corp. VAX-11/780, although she said a smaller processor could be used.

Next, the differences between the old and young face are found and recorded. Then a picture of the person's face to be simulated at a different age is recorded, modified with the differences, and the modified image is displayed.

An interactive terminal, including a graphics terminal, is coupled to the CPU. A tablet or light pen is used for modifying the graphics image. The apparatus also includes an I/O interface, which couples the processor to the graphics terminal, and a printer. Also coupled to the processor are a frame buffer and a video display.

Two collaborators, Richard Carling and David Kramlich, designed most of the software that is used with the age machine.

In one instance, Burson used family photographs to create a composite image of what child kidnapping victim Kurt Newton might look like today, eight years after the crime. "We study photographs of the family, and if there is somebody in the family who resembles the child, I do a composite," she said.

In more artistic applications, Burson has used the age machine to create photographic composites of Brooke Shields and John F. Kennedy Jr. in middle age. She also has done composites of movie stars such as Jacqueline Bisset, Marilyn Monroe, Audrey Hepburn and Jane Fonda to demonstrate how an ideal beauty might look.

Another portrait, Big Brother — a composite of world leaders Adolf Hitler, Ayatollah Khomeini, Mao Zedong, Benito Mussolini and Joseph Stalin — was used last year as part of a CBS documentary titled *1984 Revisited.*

Her work also has appeared in *People* magazine and was recently displayed at a New York art gallery.

The age machine not only can show a younger person aged, but can work in reverse as well, Burson said.

Burson believes that the commercial applications for the age machine are extraordinary. In February, Burson and some associates founded Face Systems, Inc., a company that plans to sell the age machine to plastic surgeons.

CORRECTIONS

Data General Corp.'s revenues for the quarter ended March 10 totaled $248.4 million, up from $187.1 million a year earlier. The erroneous figures in the April 16 edition of *Computerworld* — $229 million for the second quarter of 1984, compared with $178.7 million a year earlier — were DG's reported costs and expenses.

Management Assistance, Inc. (MAI), the New York-based minicomputer maker and computer maintenance firm, earned $1 million in the year ended Sept. 30, 1983 and $7.5 million in 1982.

The April 9 *Computerworld* story that said MAI had lost money the past two years should have said, instead, that in factoring out inflation, the company's continuing operations lost $3.4 million in 1983 and $2.2 million in 1982.

Each module of DSS Development Corp.'s Optionware [CW, April 9] costs $130, not $300.

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NEWS

'Forget' to pay your taxes last week? Expect a call

By James Connolly
CW Staff

Tax Day 1984 passed with the usual sigh as the American taxpayer dropped another year's worth of W2 and 1040 forms and assorted schedules into the mail slot by the 11:59 p.m. deadline April 16.

But while the last-minute rush was the same as usual, and the tendency for some Americans to cheat Uncle Sam may have been the usual state of affairs, at least one thing has changed since Tax Day 1983. The Internal Revenue Service has added computers to the tax collection force that battles those cheats. In particular, in the past year the IRS has added automated collection systems to 12 of its 21 telephone collection sites.

The GC Services Corp. Automated Collection System (ACS), including software and IBM 4341 mainframes, helps collectors initiate dunning letters and telephone calls to delinquent taxpayers. The system integrates data bases with an automatic call distributor.

Taxpayers — or nontaxpayers, as the case may be — who disregard the first four collection notices sent by IRS regional offices will find their accounts shifted to the automated collection sites spread throughout the country. The system became operational in Kansas City, Mo., and Memphis last year and by summer should cover the country, with 2,000 operators manning IBM 3101 terminals.

The IRS hopes it can use the system to collect the $27 billion it is owed in back taxes. "Pilot programs in Kansas City and Memphis last year showed that the automated collection systems closed 50% more delinquent accounts than the old system. At the same time, ACS already has reduced the cost of closing each case to $29 from $45, and the program is still new," said William I. Davis, general manager of the Houston-based GC Services' Systems Division.

The collection system is being established under a six-year, $107 million contract to GC Services, with IBM, Arthur Andersen & Co. and Rockwell International Corp. acting as subcontractors for hardware and software, according to IRS officials.

It will take several months before most 1983 tax year accounts are referred by regional offices for automated collection. But when they are, the system will help collectors contact individuals and businesses according to a complex formula that ranks accounts by factors such as the amount owed and the age of the account.

According to the IRS, the system updates accounts weekly. When an operator sits down at his terminal, he presses a Next Case function key that calls to the screen data such as a taxpayer's name, address, Social Security number and tax liability. The display also tells the collector what previous collection steps have been taken and what the outcome of those steps has been.

If the system indicates that a dunning letter, levy against wages or lien may be due, the operator uses the system to notify the IRS regional office. However, if a telephone call is in order, the operator presses the Dial function button, which tells the system to call the taxpayer using the least expensive routing for the call. If the line is busy, the account is scheduled for a later call.

Equipped with headsets, operators can discuss the case with the taxpayer and use the terminal keyboard to update the on-screen data with information such as a promise to pay. Scheduling of calls considers time zone differences and a person's working hours, if known, according to IRS officials. The system is designed to prevent calls to taxpayers before 8 a.m. and after 8 p.m.

AT&T profits take a plunge

MILWAUKEE — In its first financial quarter since the divestiture of its local operating companies, AT&T last week reported it realized a profit of only $226.9 million and said it does not expect to meet its 1984 profit goal.

Three of the seven regional holding companies each realized larger profits than AT&T. Bell South reported profits of $270.4 million, or $2.80 per share; American Information Technology reported profits of $257.6 million, or $2.66 per share; and Bell Atlantic reported profits of $235.4 million, or $2.44 per share.

AT&T's per-share profit of 20 cents was only 9.9% of the $2.02 per-share earnings that AT&T previously predicted for the year. AT&T Chairman Charles L. Brown told the annual shareholders meeting held here last week that the estimate will probably not be reached.

AT&T had revenues of $8.04 billion in the first quarter. Because of the divestiture, comparisons with the first quarter of 1983 were not available. Brown predicted "a rough couple of years" for the company, but said he expects better profits for the remainder of this year.

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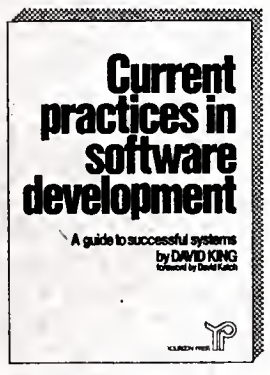

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NEWS

Schools nix DOD proposal to censor research reports

By Edward Warner
CW Staff

CAMBRIDGE, Mass. — Harvard University last week became the fourth major university to tell the U.S. Department of Defense that it will not accept DOD funding for research projects if DOD wants to censor the reports which result.

Harvard's statement was issued in response to a Pentagon proposal, made two months ago, that research reports for projects it funds should be submitted to its censor at least 90 days prior to publication.

The proposal would restrict public access to reports which contain any material found to be "sensitive" to the national defense, but did not define that term.

The presidents of three other major universities, all with millions of dollars in DOD research contracts, reportedly sent a letter to DOD last month that protested the censorship proposal and said their schools — Stanford University, the California Institute of Technology (Caltech) and MIT — would refuse those contracts affected by the proposal if it is adopted.

Harvard joined their ranks last week saying, in the words of its general counsel and vice-president, Daniel Steiner, "We will not agree to any restrictions, by the Defense Department or anyone else, in the right to publish research results."

Steiner's remarks appeared in the Harvard campus newspaper, which also said the university received $4 million in Pentagon research funding last year.

A Pentagon spokeswoman responded to the letter from the presidents of Stanford, Caltech and MIT by saying, "We welcome comment from all parties." She noted that the proposal is still only under consideration.

She also claimed the proposal would not censor any research reports, but simply restrict access to the reports to certain people or groups, such as certain defense contractors or members of DOD.

Spokesmen at Stanford, Caltech and MIT were not able to say how much of their schools' DOD research was in computer-related areas, but the chairman of MIT's department of computer science, Dr. Harry Lewis, said his department gets as much as $250,000 annually in Pentagon research funding.

MIT last year received roughly $30 million in research funding — out of its research budget of $219 million — from the Pentagon, according to the institute's assistant to the president, Walter Milne, who added that opposition to academic censorship has "been our policy for a long time." Stanford received $28 million of its $137 million research budget from Pentagon funding.

House panel recommends killing Postal Service's Intelpost

WASHINGTON, D.C. — Intelpost, the U.S. Postal Service's international electronic mail service, has realized only $60,000 in revenues after three years of operation and should be terminated, the U.S. House of Representatives' Committee on Government Operations has recommended.

The service, a cooperative venture with foreign telecommunications authorities, has cost the Postal Service more than $6 million to develop and operate since 1978. Customer use of the service began in 1982.

While a market for Intelpost may exist, the Postal Service has not been able to manage it successfully in a competitive environment, a report issued by the House committee said. It suggested the Postal Service hire outside management consultants to recommend new directions for the service.

Intelpost service centers are located here in Washington and in New York, Houston, Chicago and San Francisco.

Customers transport Intelpost messages to the centers, where a scanner reads the document and then stores it for transmission. The message is printed out and sent through the regular postal mail at the receiving end.

Canada and countries in Europe, the Far East and South America are connected to the system. Intelpost's cost per page is currently $5. While volume has been growing slowly, it has not met the Postal Service's projections.

Total revenues for the three years of operation totaled $58,080. Postmaster General William Bolger told the Postal Service board of governors in February that the service considers Intelpost a "research and development project, and we didn't expect it to meet our costs."

The House report accuses Bolger of misleading the House committee in asserting that Intelpost would not be supported through cross-subsidies from other regular mail revenues. The report also scorned the board of governors for not taking a firmer oversight role in the service and for not following recommendations that the price per page initially be set at $2.

OLMDS from page 1

The reasons for Bank of America's insistence on keeping at least a copy of OLMDS' source and object code are myriad.

First, the bank warned of "catastrophic" and "devastating" injuries both to itself and to its customers if it were stripped of the disputed software entirely. After years of routine use within the Bank of America, OLMDS has become so thoroughly assimilated into the bank's existing EFT programs that the system has ceased to exist as a discrete entity, according to affidavits filed in Superior Court.

Another reason for the bank's reluctance to part with its OLMDS software is that the institution reportedly considers Tinmahan's ownership claim invalid and challenges the consultant's account of the system's origin.

If, indeed, the software exists at all, the court documents said, the system came into being only long after the consultant entered into his contractual relationship with the bank.

Under a perpetual licensing agreement that Tinmahan signed in 1981, any software written during his affiliation with the Bank of America automatically becomes the property of the client, the bank contended in its filings.

Tinmahan, however, challenged the bank's interpretation of the perpetual licensing agreement, rejected the bank's claims of ownership and insisted on exclusive possession of the OLMDS source code. OLMDS forms the cornerstone of the consultant's livelihood, and if the bank continues to deny him access to the source code, his Orinda, Calif.-based company will be unable to attract new clients and will go bust, Jones said.

Tinmahan also objected to the Bank of America's steadfast refusal to surrender the security portion of the OLMDS software. In the absence of its proprietary, crucial security programs, the disputed system would be rendered "inoperable," the consultant said in his court papers.

Tinmahan's demands for access to the OLMDS source code have acquired an increased urgency during recent weeks with the revelation that the financial institution is apparently working feverishly to convert the system to run on an Amdahl Corp. 470V/5 mainframe. In the past, the disputed software and the bank's EFT network programs have resided in an IBM System/3, Tinmahan said.

If the source code remains in the bank's possession and the conversion continues unimpeded, OLMDS will eventually be revised so extensively that it might become virtually impossible for the consultant to identify it as his own, Jones added.

Consultant's wrangle with bank started last September

The roots of Gulab Tinmahan's legal wrangle with the Bank of America stretch back to 1976, when the consultant won a contract to modernize the bank's domestic and international electronic funds transfer (EFT) system, known as Remittance Account Procedures/Outgoing Cable Interface (RAP/OCI).

In essence, the contractor's assignment was to transform RAP/OCI from a batch to an interactive system and, thus, substantially improve its performance.

Crucial to Tinmahan's reprogramming project was the On-Line Menu-Driven System (OLMDS), a collection of proprietary programs that drive and enhance the functionality of interactive systems, the consultant said. The software package had reportedly found its way into at least two other major user sites before the independent contractor ever entered into his working relationship with the Bank of America.

Mutually satisfactory

For roughly seven years, Tinmahan's association with the bank apparently proved mutually satisfactory.

But last September, the consultant was suddenly barred from his client's premises and denied access to the OLMDS source code after the bank allegedly uncovered evidence linking him to three unauthorized wire transfers totaling $411,000.

Through his attorney, Tinmahan denied any involvement in the illegal transactions and has responded to the allegations with a lawsuit accusing the bank of slander. Although the accusations were referred to the Federal Bureau of Investigation last summer, no criminal charges have been filed against the consultant in connection with the case, according to a source close to the dispute.

In February, the two sides met in court and negotiated an agreement to allow the contractor to reenter the bank's data center and scrutinize three disk packs in which the disputed OLMDS code reportedly resides.

But the BASF packs he was later given to inspect were clearly different from the IBM products he originally brought into the bank, Tinmahan said.

The Bank of America, however, claims to have searched its buildings exhaustively and denies having uncovered even the slightest trace of the three IBM disk packs.

The two sides also disagree sharply about where the OLMDS software is physically located. Tinmahan claims the code is scattered among various sites within the bank's corporate headquarters.

But the bank insists the system is confined exclusively to the three BASF disk packs.

DOD now wants export control over software, too

Cites 'dual nature' of off-the-shelf packages for micros, superminis and mainframes

By Bryan Wilkins
CW Washington Bureau

WASHINGTON, D.C. — The U.S. Department of Defense wants to add commercially available software with potential military applications to the list of high-tech exports it was recently empowered to review [CW, April 2].

DOD claims that the proliferating use of microcomputers and superminicomputers in key military roles here and abroad requires that export review and technology transfer controls be extended to commercially available software for such systems, as well as to the systems themselves.

The reason, DOD explained last week, is the "dual nature" of off-the-shelf software products for microcomputers, superminicomputers and mainframes, which can be modified for military applications by Eastern bloc countries.

DOD did not specify by name which commercial software products it seeks to control.

Before the Senate

Two weeks ago, top DOD officials appeared before a Senate subcommittee to show how certain systems, such as Apple Computer, Inc.'s Apple II+ and the 256K-byte Grid Systems Corp. portable computer, are an integral part of U.S. and Nato battlefield management [CW, April 16].

DOD itself modifies commercially available off-the-shelf software for military use, including nuclear targeting plans in Europe, command and control procedures and strategic decision making.

"The commercial software is vital to solving a lot of our problems, but we will still need to reconfigure that software to be sensitive to military problems, and there's where we have to build in quite a bit of protection of that software," said Dr. Stephen Bryen, deputy assistant secretary of defense for International Economic, Trade and Security Policy.

Lock on software

"We would love to have a lock on the software. It is partially commercial, but with a Defense add-on, we find that the layman is no longer a layman, and our adversaries would be able to figure it out if it is readily available," he said.

Bryen asserted that the Soviet Union has 100,000 translators working on software manuals and is frequently resorting to stealing software if necessary.

"They are quite sophisticated and know exactly what they want," he said.

A recent seizure by Swedish and German authorities of a Digital Equipment Corp. shipment [CW, Nov. 21] turned out to contain a software application that the company had not yet released to the public, he commented.

Bryen observed that the Defense Department is particularly sensitive about the VAX-11/780 line, which is currently under full export review and control by DOD, since DOD has made it the de facto 32-bit standard system for all of its military applications.

A recent advertisement in the *Financial Times* of London sought DEC programmers to write software for the Soviet Union, according to a Bryen aide, and prompted Bryen to comment, "This is not a joke."

"There is very little we do that doesn't depend on the state-of-the-art computer," he said.

"Without it, we couldn't run our supply lines, we couldn't run strategic bombing attacks, we couldn't run our strategic missiles or coordinate our submarines [or] our communications. An endless array of our defense depends on our computing capability," Bryen said.

"If the other side reaches our computing ability, the bottom line is that we lose our edge," Bryen commented.

The Reagan administration, led by the Defense Department, is currently in the midst of intense negotiations with its European allies to add the military-applicable software to a list of restricted exports to the Eastern block countries and the Soviet Union, Bryen said.

The main disagreements with Nato allies over control of software exports concern the strategic utility or potential military applications of a particular product.

"We get into debates about what kind of software has the most leverage in defense," Bryen said.

"It is a very narrow issue, technical and operational. Part of the problem in export control is determining that defense leverage," he said.

Bryen said that the agreement within the Coordinating Committee for Multilateral Export Controls (Cocom) on the software issue is "pretty close."

Cocom is the principal forum where consensus is reached among the Western allies on what specific products should be restricted for export.

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NEWS

Users, vendors say VSE 2.1.0 means DOS here to stay

By Paul Gillin
CW Staff

IBM's announcement of a new version of its VSE/System Package (SP) (story on page 1) should scotch any remaining rumors that the company is preparing to phase out its DOS operating system in favor of VM or MVS, according to users and vendors interviewed last week.

Rather, VSE/SP 2.1.0 is an IBM move to define market segments further for the three major operating systems. "Clearly they're marking out some territories," said Mark Combs, vice-president of development at Computer Associates International, Inc. in Jericho, N.Y. "DOS isn't going to compete with MVS. It's going to be a viable alternative for medium- to small-size locations or for distributed processing."

The VSE enhancements contain several features not found in MVS, indicating that IBM is not pushing DOS users to migrate upward immediately. However, the IBM programming announcement also flatly stated that "VSE customers experiencing high growth rates should plan to migrate to MVS" and implied that 31-bit addressing would not be extended to VSE.

Users generally applauded the enhancements. "It's the largest VSE announcement I can remember in terms of capabilities," said Pete Clark, systems programming and data base/data communications administrator at Olin Mills, Inc. of Chattanooga, Tenn.

Added Computer Associates' Combs, "It's head and shoulders above anything previously available for DOS in terms of ease of use and installability."

Clark said the VSE extension to 40M bytes of virtual addressability will ease the on-line burden that has caused him recently to spread his IBM's CICS over multiple machines. "It allows me to regroup some of my on-line facilities that I had split up in the past because of virtual storage constraints," he said. "I can continue to enhance my current applications, add new ones and migrate back some of the applications I had moved off to the other machines."

Clark also lauded enhancements to the VSE librarian that he said present "significantly less chance of a library integrity problem." Space reclamation features and an increase in block size from 160 bytes to 1K byte will also improve library efficiency, according to Clark.

Virtual addressability improvements will help keep many users within the VSE fold who might otherwise have considered migration to MVS, according to Neal Ater, vice-president of product development at Goal Systems International, Inc., a vendor of IBM-compatible systems software based in Columbus, Ohio. "Before, as soon as people ran out of 16M bytes on VSE, they had to jump to MVS/SP, then later to XA," Ater said. "Now they can stick with VSE until they need to go to XA."

However, one user was lukewarm about the virtual address enhancements. "I don't think it addresses the real needs," said Bob Heist, manager of technical services at Carpenter Technology Corp. in Reading, Pa. "There is no intent at all to extend beyond 16M bytes of real [addressability]. It's still a temporary fix for any shop that's going to see a growth pattern over the next few years."

Heist noted that VSE/SP 2.1.0 fails to address some other problems of large VSE shops. "File sharing is not something that VSE supports with any great amount of integrity," he said. "There have been no architectural changes to the performance function of VSE itself as far as alternate path Dasd [direct-access storage device]. You're still limited to doing an I/O the way you're doing an I/O right now. And when you get into any kind of a large system or multiple systems sharing Dasd, the I/O subsystems can become the biggest part of the system."

Combs called the new interactive interface the most important enhancement of the new release. "This will give IBM, end users and software companies the ability to put applications into a common, easily manageable form," he said. "IBM is opening the door for people to extend the DOS environment and make it easily more user-friendly. IBM has finally come out with a globally accepted standard."

Perhaps most importantly, observers agreed, IBM has stated that DOS/VSE is here to stay. "It puts to end forever the belief that DOS is dead or VSE is going away," Clark said. "IBM is not going to spend this kind of time and money on a product it doesn't plan to continue."

Added Goal Systems' Ater, "This indicates to us that IBM is really committed to VSE as one of its 'strategic operating systems.' "

DOS/VSE from page 1

Vtam Entry.

The networking facilities of VSE/Power Version 2 support the transfer of jobs and job output. A network definition skeleton can be used to create network resource definitions and transport them from host to nodes. New dialogues simplify the configuration of local Systems Network Architecture (SNA) and non-SNA IBM 3270s, the spokesman said.

Support for connection of Personal Computers and IBM 3270 Personal Computers is provided with IBM 3278/3279 emulation attached to an IBM 4321, 4331 and 4361 processor. Data transfer from the micro to the host and storage in a predefined file is supported along with downloading from the host to the micro, movement of host-created data to the host transfer file for download and access to host applications from the Personal Computer. File transfer is always initiated from the Personal Computer, IBM said.

VM/VSE support is added with the VM/VSE Console Communications Facility shipped as a component of VSE/SP 2.1.0. A number of other enhancements were also announced to ease the process of using VSE under VM.

A major enhancement to VSE/Advanced Functions, which is part of the VSE/SP 2.1.0 package, is expansion of virtual address space from 16M bytes to 40M bytes. VSE supports up to three virtual address spaces, each of which can be up to 16M bytes, IBM said. In addition, VSE libraries have been introduced that provide a single, logical library structure with a common data format for source books, relocatable modules, phrases, procedures and user-defined library types.

Direct-access storage device (Dasd) space is utilized more efficiently through a larger blocking factor and the reuse of freed space, IBM said. Automatic reclamation of freed space is said to eliminate the need for library reorganization. An improved user interface is included with equivalent library functions for count key data and fixed-block architecture Dasd and extended library access control. A 1K-byte block is used for the new library.

Conditional JCL statements and parameterized procedures have been added to ease handling and maintenance of job streams.

The process of determining I/O configurations has been partially automated, and the Dasd sharing concept of VSE has been generalized with up to 31 CPUs participating. Tape I/O modules have been eliminated, IBM claimed.

A number of enhancements have been provided to improve VSE availability, including improved handling of certain channel and machine checks. Serviceability and installability upgrades were also unveiled.

A full-function VSE/SP 2.1.0 system licenses for $48,500 for a basic license and $43,650 under the Distributed System License Option. Also available are monthly charges of $2,025 and $1,825, respectively.

IBM's National Accounts Division is located at 1133 Westchester Ave., White Plains, N.Y. 10604.

VSE/ICCF, Power updated

WHITE PLAINS, N.Y. — As part of its announcement of VSE/System Package (VSE/SP) 2.1.0, IBM also added features to VSE/Interactive Computing Control Facility (VSE/ICCF) and VSE/Power.

VSE/ICCF 2.1.0 features include adaptation to VSE/Advanced Function 2.1.0, VSE librarian and VSE/Access Control; quiescing/recovery without CICS/DOS/VS shutdown; disconnect capability from a VSE/ICCF terminal or user via the VSE operator console; improved interface to VSE/Power; improved VM/VSE handshaking; conditional job execution in an interactive partition; data retrieval from a VSE/Power reader queue; transparent access to VSE library; improved list processing; Help facilities; concurrent usage of VSE/ICCF Power functions; improved command handling; and elimination of terminal wait if no interactive partition is available.

VSE/Power 2.2.0 enhancements include shared spooling; virtual addressability extension support; cross partition support; source library inclusion support of the VSE/ICCF library; support of job control return codes; extended VM linkage support; remote job entry improvements; and accounting upgrades.

The modules are available individually or as part of the full-function VSE/SP package. VSE/ICCF costs $5,595 for a basic license or $5,035 for a Distributed System License Option (DSLO). VSE/Power is available for an initial charge of $465 (basic) or $420 (DSLO) and a monthly license charge of $155 (basic) or $140 (DSLO).

IBM's National Accounts Division is at 1133 Westchester Ave., White Plains, N.Y. 10604.

University of Texas plans 32 DP-related faculty slots

AUSTIN, Texas — The University of Texas announced last week that it will establish 32 new professorships in the fields of computer studies, microelectronics, computer-aided design and other engineering and science areas.

Each faculty position will be endowed by a $1 million fund, pledged in large part by an anonymous donor and five Texas foundations and backed by the university itself.

University President Dr. Peter T. Flawn said eight fields of study — chemistry, physics, mathematics, molecular biology, computer engineering, computer-aided design and manufacturing and materials engineering — will each have four new professorships.

Emphasis will be placed on filling the new professorships with research-oriented individuals, according to Flawn.

The city of Austin is also the headquarters of the Microelectronics and Computer Technology Corp. (MCC), a research venture company backed by a number of leading U.S. high-tech firms.

Those firms include: Control Data Corp.; Digital Equipment Corp.; Harris Corp.; Advanced Micro Devices, Inc.; NCR Corp.; Motorola, Inc.; Sperry Corp.; National Semiconductor Corp.; and Honeywell, Inc. MCC is headed by Adm. Bobby Inman (USN Ret.), former deputy director of the Central Intelligence Agency.

MCC, which is building a research facility on the campus, is still seeking additional high-tech corporations to join its venture program, which is tailored toward the development of a fifth-generation computer and related studies.

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*Frank L. Chisholm is Cullinet's Executive Vice President. Frank has worked closely with Cullinet users and prospective users for more than six years. As a key member of Cullinet's management team, Frank has contributed heavily to Cullinet's database product development strategy.

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Public-access telephone/terminal put on display

CW AT VIDEOTEX '84

By Phil Hirsch
CW Washington Bureau

CHICAGO — A public telephone equipped with a keyboard and a screen was among the products shown here last week at Videotex '84. The terminal is now being tested by two divested Bell operating companies, and its manufacturer, Quazon Corp., is discussing similar arrangements with most of the other divested Bell operating companies.

The Videotex Public Access Telephone Terminal (Vpatt) has been installed at Boston's Logan International Airport by New England Telephone Co. (see story below) and at Chicago's O'Hare International Airport by Illinois Bell. According to David W. Tibbetts, who is in charge of the New England Telephone trial, users who dial a local or 800 number can access any of several public data base services through the keyboard. They can then read the retrieved information on the terminal's 24-line by 80-char. monochrome screen, he added.

Users also can access private data bases. A traveling salesman, for example, might obtain inventory information or price quotes stored in a home office computer system. Tibbetts, who said additional installations of Vpatt are likely this year at Logan as well as at some Boston hotels, noted that one user recently employed the terminal to make some changes in a stored computer program.

In addition to the monitor screen and keyboard, the terminal has a built-in credit card reader and a standard phone handset. Vpatts can serve as conventional telephones as well as data terminals; in either case, the credit card reader enables the phone call to be charged.

The reader also enables data base service charges to be billed to the user's credit card, a Quazon spokesman explained. He reported that at least one data base operator is changing its computer software so that users who call via Vpatt can be accommodated even if they are not subscribers to the data base service.

New England Telephone is exploring the possibility of using the Vpatt monitor screen to display advertising messages, Tibbetts said. The system has a memory capacity of up to 96K bytes, and a single screen requires 2K bytes. Currently, the information is formatted at a central site and stored on a cartridge, which then is hand-carried to the phone and manually inserted.

In a paper presented at Videotex '84, Tibbetts said that a color monitor, along with a NAPLPS decoder, will be added to Vpatt in September. NAPLPS, which stands for North American Presentation Level Protocol Syntax, is a videotex display formatting standard developed by AT&T, but based largely on Canada's Telidon protocol.

At Boston airport, mixed reactions to videotex terminal's first flight

It's too new, some claim

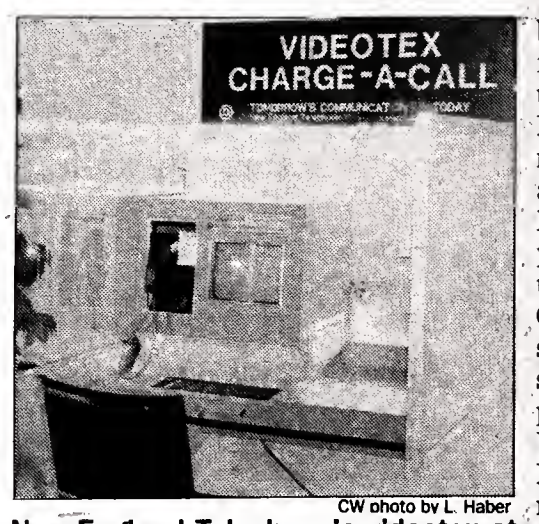
By Lynn Haber
CW Staff

BOSTON — Travelers who passed through a busy commuter terminal here at Logan International Airport last week cast a curious but leary eye at the latest automated device to populate the main lobby. But while they used the other computerized devices in the Eastern Airlines terminal — an automated teller machine, a machine that dispenses tickets and boarding passes, even an IBM Personal Computer XT micro that Big Blue had on display — with little hesitation, they shied away from the recently installed public access videotex terminal.

"I think it's too new," one traveler said. "Most people don't know about this type of thing yet."

The videotex terminal, installed for a three-month market trial by New England Telephone Co., lets travelers tap into hundreds of news, business, weather and other data bases. It also lets them receive and send messages through electronic mail systems and link up with and use a home or business computer in another location.

"Good idea. I like it," was the sentiment expressed by one onlooker here last week. "I can see using something like this."



CW photo by L. Haber

New England Telephone's videotex at Logan International Airport

The videotex booth here at Logan includes a New England Telephone public charge-a-call telephone, CRT terminal and keyboard. A user dials the telephone number of the particular service he wants to use and enters his New England Telephone Calling Card number and the individual password or code for the service or computer being accessed.

The telephone call is billed to the Calling Card number, and the company providing the videotex service bills the customer for time used in its usual manner.

National and local networks available on the New England Telephone videotex terminal include Omnet, Inc.'s Businessnet; Compuserve, Inc.'s Compuserve; General Videotex Corp.'s Delphi; MCI Communications Corp.'s MCI Mail; GTE Telenet Communications Corp.'s Telenet; Tymshare, Inc. 's Tymnet; United Telecom's Uninet; and Considine Computing Services' Yellow Data, according to New England Telephone.

Most of the networks that are currently available are subscription services, and only registered users can access those data bases. Yellow Data, a network that is advertised on the videotex display terminal as "New England's Public Access Video Publication," provides a calendar section, a professional directory as well as a classified section.

Directronix, a soon-to-be-available service that does not require a number or password, is said to be an electronic guide to restaurants, shops and entertainment, a spokesman said.

Business travelers targeted

"We believe this service will be convenient in areas frequented by business travelers," according to a spokeswoman for New England Telephone.

"We're offering this service on a trial basis to determine whether there is sufficient interest to warrant expansion to other locations throughout New England, including other airport locations, hotels and convention centers," she went on to say.

According to New England Telephone, the videotex station, which is presently situated against a wall out of sight from the terminal entrance and airline ticketing counter, is slated for future relocation under the airline schedule display terminals — a more centralized and visible area of the airline's main lobby.

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Wang makes videotex debut

CHICAGO — Wang Laboratories, Inc. made its entry into the videotex market here last week with a $250 software-based decoder for users of its Professional Computer.

Available in June, Wang's first diskette-resident decoder implements Prestel, the British videotex display formatting system. The company said it will soon offer decoders supporting the North American Presentation Level Protocol Syntax (NAPLPS), developed by AT&T and supported widely in the U.S.; the French-developed Teletel protocol; and West Germany's Cept protocol.

To employ the PC Viewdata Decoder announced last week, a user of the Professional Computer (which costs approximately $2,550) needs a Wang color monitor control card, priced at approximately $400, and a color monitor. To access remote data bases, a modem is also required. The resulting system reportedly displays text and graphics in up to eight colors and offers full blinking for highlighting portions of the text or graphics.

Through the decoder, a Wang Professional Computer user can access remote public or private data bases employing the Prestel format or can interact with Prestel-encoded videotex frames stored locally. The Wang Professional Computer's Winchester disk holds 2,500 videotex frames, while the system's diskettes hold 300 frames each, according to the company.

Additional information about the decoder is available from Wang, which is headquartered at One Industrial Ave., Lowell, Mass. 01851.

Applicability of videotex to business users debated

CW AT VIDEOTEX '84

By Phil Hirsch
CW Washington Bureau

CHICAGO — There was much talk about business applications for videotex here at the Videotex '84 conference last week, but little was said about why business users would — or should — invest in the technology.

Tom Taylor, vice-president for advanced network applications at GTE Telenet Communications Corp., came closest to addressing this question when he said the retrieved data must provide "perceived added value" to the end user.

Like most of those who spoke about business applications of videotex, Taylor indicated that growing use of personal computers in the nation's front and back offices will lead to the growth of the videotex market. "The current microcomputer boom will continue to open the market in a very aggressive . . . fashion," he said.

According to Taylor, there are 3.5 million personal computers in use by business. Twenty-five percent of these are equipped with modems, and this percentage [will increase] to over 50% by 1987. In addition, Link Resources Corp. has estimated that by 1987 there will be almost 60 million personal computers installed in the U.S., 19 million of which will be in business, he said.

Somewhat different figures that nevertheless reflected the same general trend were presented by Brian T. Dugan, vice-president of the Gartner Group, a Stamford, Conn., consulting firm. Dugan predicted that by 1990, U.S. business will be employing 62 million white collar workers using 59 million personal computers, of which 23 million — approximately 40% — will be equipped to communicate with videotex data bases. Today, by comparison, there are 49.6 million white collar workers and 4.9 million "white-collar" personal computers in use, of which 400,000 support videotex.

Dugan also said that 80 videotex system operators currently offer a total of 1,900 public access data bases; these will earn $67 million in access and subscription fees this year. Their current compound annual growth rate is 78%, according to Dugan, who added that corporate customers account for the bulk of their business. He expects this pattern to continue until 1987, when home applications of videotex will begin to predominate.

Another view into the future of nonresidential videotex came from Thomas Rauh, a retail merchandising consultant at Touche Ross & Co. Videotex, he said, "won't play a significant role in retail marketing until the late '80s or early '90s." Rauh said this would be the case even though retailers in general are earning smaller profits and facing stiff competition from discounters, mail order merchandisers and others offering "no frills" shopping and even though "electronic merchandising" promises higher profit margins.

"Perhaps the most limiting factor in the growth of videotex shopping," Rauh said, "will be the consumer's reluctance to trade the excitement and pleasure of a store visit for the convenience of at-home shopping."

Videotex out from Honeywell

CHICAGO — Honeywell, Inc. displayed its first two business-oriented videotex systems here last week at Videotex '84. Each system carries a base price of about $125,000; user terminals are priced at $600 to $1,000 each.

Typical installations of either system reportedly would serve 600 terminals.

One system, Infonow, utilizes network software and a user terminal developed in France and resides on a dedicated Honeywell DPS 6 minicomputer. The other system, Retrv, was developed in England and employs either a dedicated DPS 6 or part of the capacity of a Honeywell DPS 8 mainframe. It typically interfaces with the user through Prestel-based videotex terminals, which may include a key pad instead of a keyboard and/or a standard TV set instead of a CRT screen.

Typical applications of Retrv and Infonow include electronic mail and messaging, legal and contract document retrieval and editing, telephone directory listings, purchase order files, product directories, price lists, organizational data and product reference libraries. The systems are particularly appropriate where there is a need to make large volumes of information available to many users.

While Infonow and Retrv are the first two videotex systems to be marketed by Honeywell, the company earlier became a partner in Keycom Electronic Publishing, Inc., which recently began marketing a home videotex service based in Chicago.

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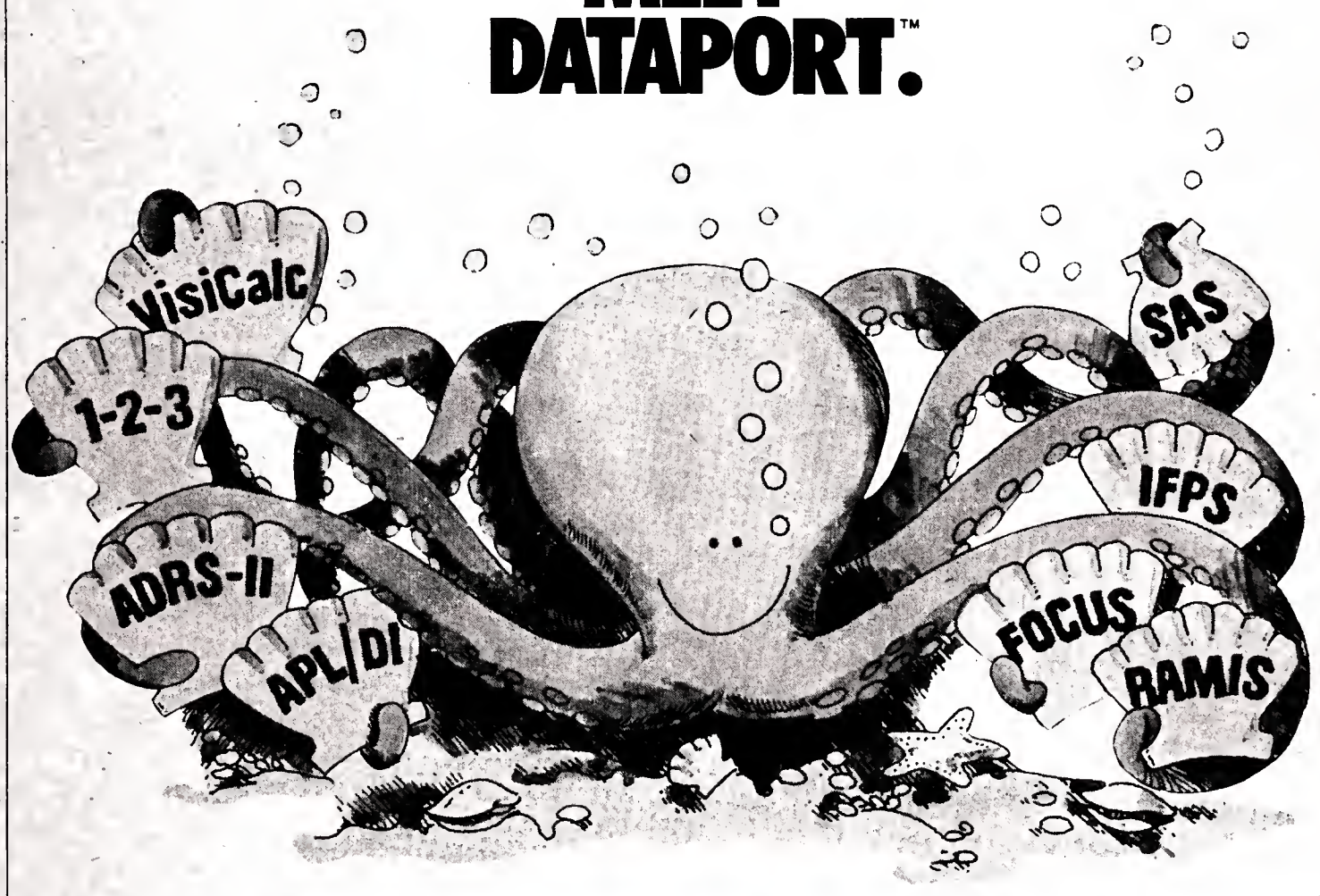

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CW 4/84

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Justice halts DP leasing schemes as tax shelters

By John Gallant
CW Staff

SAN FRANCISCO — In conjunction with the U.S. Internal Revenue Service's efforts to crack down on illegal tax shelters, the Justice Department's Tax Division has obtained a consent agreement against the promoters of a shelter involving sales of computer hardware and software.

According to a Tax Division spokeswoman, investors were sold "grossly overvalued" computer systems, which they would lease back to the defendants. The systems were then made available for leasing to local businesses, and investors were able to claim excessive income tax deductions and credits based on the purchases of the computer equipment.

Named as defendants in the suit from which the consent agreement stemmed were Computer Alternatives, Inc. of Larkspur, Calif.; its president, Robert K. Ramers; and John M. Holdaway, owner of Compumaster Financial Services of Sandy, Utah. The agency's suit for injunctive relief was filed concurrently with the consent agreement, which was approved by a U.S. District Court judge here April 6.

The agreement enjoined the defendants from selling the C/A Tax Shelter, offered to investors since 1982. In separate agreements with the IRS, Ramers and Computer Alternatives were ordered to pay $30,000 in penalties, and Holdaway was ordered to pay $20,000, the spokeswoman said.

The Tax Division's suit claimed that, for 1982 alone, the potential loss in tax revenue to the U.S. Treasury resulting from sales of the shelter was in excess of $2.2 million. No estimate of potential tax loss was given for 1983.

Filed at the request of the IRS, the suit charged the defendants with violating the Internal Revenue Code by organizing and selling the C/A Tax Shelter. The agency alleged that investors claimed interest, expense and depreciation deductions and investment tax credits based on the overvalued computer systems.

During 1982, the spokeswoman said, 101 systems were sold to investors at prices ranging from $24,950 to $50,328.

She explained that investors would pay a small down payment on the computer hardware and software and then agree to pay the balance in installments. The investors would simultaneously lease the systems to Compumaster Financial Services, which would then assume the installment obligations.

The suit maintained that the pricing of the computer systems lacked economic substance and that investors had no reason to bargain for lower prices since "the tax benefits . . . were sufficiently advantageous to make the remaining economics of the investment insignificant."

Computer Alternatives' Ramers told *Computerworld* that he and Holdaway entered into the consent agreement to avoid a costly and lengthy legal battle with the Tax Division. He said the agency objected to the C/A Tax Shelter because it claimed the defendants had overestimated the value of the vertical market software packages included with the computer systems, an allegation Ramers continues to dispute.

Ramers claimed the IRS' year-long investigation "virtually destroyed" Computer Alternatives, which he said was formerly a "thriving, $5 million-a-year systems house." He added that most of the computer systems sold to investors through the C/A Tax Shelter were based on the Altos Computer Systems, Inc. Altos Series 5 microcomputer in combination with financial planning, insurance and real estate industry software packages developed by Holdaway.

Wang agrees to buy into maker of switching systems

By Peter Bartolik
CW Staff

LOWELL, Mass. — Wang Laboratories, Inc. last week announced it had agreed in principle to purchase 15% of Intecom, Inc. of Allen, Texas, a manufacturer of communications switching systems and related communications products.

Subject to approval by the boards of directors of both companies, Wang initially will purchase 1.5 million shares directly from Intecom at $15 each, for a total of $22.5 million. Later in the year, Wang said, it would acquire an additional 3.5 million shares either publicly or from Intecom, for a total price not to exceed $66.5 million, or as much as $19 per share.

The agreement limits Wang's future stock acquisition to a 30% ownership share and provides for up to two Wang representatives to take seats on Intecom's board of directors.

C. Michael Bowen, president and chairman of Intecom, told *Computerworld* that the agreement hinges on technical and marketing considerations and said capital investment considerations "were absolutely not any force at all" in the negotiations.

He noted that the company has "a considerable amount of money in its coffers" and could go back to the marketplace at any time for further capital.

At the end of 1983, Intecom reported in its annual financial report cash assets of $86 million.

In a prepared statement, John F. Cunningham, Wang's president and chief executive officer, said the market requires and Wang intends to provide "a single network that allows telephone and computer equipment to transport information with equal ease."

Frederick A. Wang, executive vice-president and chief development officer, said the agreement "represents a major expansion of our communications capabilities and will allow users to run the applications and services they need over a choice of either coaxial cabling or telephone wiring."

Intecom, in recent months, has obtained prestigious contracts to supply its Integrated Business Exchange family of switching systems to three regional holding companies: New York New England Telephone Co., Bell Atlantic and Southwestern Bell Corp.

Wang said it still intends to pursue its open architecture philosophy and to promote interfacing and integration with other leading private branch exchange vendors.

HP, China to join forces

PALO ALTO, Calif. — On the eve of President Reagan's visit to China, Hewlett-Packard Co. last week announced that it has reached an agreement in principle to set up a joint venture company to manufacture and sell its products in the world's most populous country.

China-Hewlett-Packard Ltd. will be owned 50% by HP and 50% by the China Electronics Import and Export Corp., a foreign trade organization within the Chinese Ministry of Electronic Industry, which represents more than 2,000 electronics enterprises in the country. The agreement calls for HP to establish a headquarters facility in Beijing and specifies the construction of a manufacturing facility in China at a yet-undetermined time and location.

HP said the joint venture company will manufacture selected products from its current line of computer and electronic instrumentation products to be sold primarily within China.

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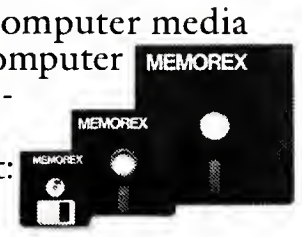

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Voice/data PBXs: More than today's users need?

PRODUCT SPOTLIGHT

By John Dix
CW Staff

The drive to meet the evolving need for flexible data communications within the office has pitted two technologies against each other: private branch exchanges (PBX), which can carry data as well as voice, and local-area networks.

What these two technologies have in common is connectivity, or the ability to link one device with multiple resources. Each technology has been advocated as an end-all solution for office data communications needs. According to present conventional wisdom, however, local networks and voice/data PBXs will coexist.

There are four general "generations" of PBXs, depending on who is supplying the parameters to make the distinctions:

■ The first-generation PBXs were electromechanical cross-bar types of switches.

■ The second generation typically included switches with stored program control, but were limited in their ability to handle data.

■ Third-generation PBXs are all digital and provide, among other things, increased data-handling capabilities, support for both digital and analog telephone transmissions and the ability to be interfaced to computers and digital communications trunks.

■ Fourth-generation switches exist, for the most part, on manufacturers' drawing boards. Companies like Ztel Corp. in Wilmington, Mass., and CXC Corp. in Irvine, Calif., claimed that their switches provide voice communications, but have internal local-area networks that will eventually provide the higher speed capabilities associated with local networks. The verdict on switches of this generation is still out, withheld until it can be seen if the products live up to their design expectations.

Ironically, users of third-generation switches, the type supplied today by the major PBX vendors (see chart), are barely tapping their PBXs' data-handling capabilities. Ian Angus, president of Angus Telemanagement Group, a Toronto-based research organization, claimed that "there are only a few hundred companies in North America that are switching data through PBXs."

Angus has found that users specify voice and data capabilities when evaluating PBXs, but end up using them as voice switches only. The fact that users specify data-handling capabilities at all when they are ready to purchase a PBX stems from their uncertainty regarding future needs, Angus believes.

'Vendors are providing users with capabilities they don't want.' — George DeSalvo, International Data Corp.

"When looked at practically," he said, "manufacturers can't find users that want to go faster than 9,600 bit/sec asynchronously, even though most switches are now capable of supporting speeds up to 19.2K bit/sec asynchronously and 56K bit/sec synchronously."

Michael Schumer, vice-president and director of telecommunications at the Gartner Group, a Stamford, Conn., research firm, said that voice/data PBXs are an option for "companies that have done strategic planning and have found an evolving need for data switching." In other words, users are feathering their nests against future unknowns, insisting that their PBXs be able to switch data even if they do not have any immediate intention of using that capability.

Others agreed. "Vendors are providing users with capabilities they don't want," said George DeSalvo, director of International Data Corp.'s Communications Technology Service in Washington, D.C.

Nevertheless, most industry watchers agree that the voice/data PBX will play a role in future intraoffice data communications. Angus is even more adamant; he said that "the PBX will become a fundamental part of data communications," coming into its own because:

■ It provides users with switched access to many resources, including multiple mainframe environments, eliminating the need to have dedicated terminals for each application.

■ It is particularly useful for the occasional user, typified by the manager who wants to tap into various central data bases once in awhile and who uses applications such as electronic mail.

In both regards, the driving force behind the scenes is the personal computer. Eric Killorin, president of Hyatt Research Corp. in Andover, Mass., predicted that "the PBX will be best used as a resources-sharing hub, particularly for personal computers."

Angus concurred. "When people demand that their personal computers communicate, the PBX will be the simplest way to provide that access."

Schumer is not so sure. While he agreed that the personal computer is forcing the issue of data communications within the office, he saw the need being initially met by small local-area networks.

"Local-area networks are good for swapping data within a small community of interest," Schumer said. "As the community of interest expands out of small work groups, the need arises to share information from one group with another, and that's where the PBX will fit in."

Some analysts warn that not all PBXs take well to data switching. PBXs of the second generation can be outfitted to switch data, but doing so can adversely affect the device's main task, voice switching.

Ron Frank, managing director of Frank Communications Group, a research and consulting organization in Mount Vernon, N.H., said that "when a personal computer is logged onto a data base and run through the switch for hours, the voice-switching capacity of the switch will be affected."

Regarding the newer switches that have been designed to carry data, Frank noted that, beyond the technical feasibility of "cramming apples and oranges into the same crate," there are some "seri-

See **PBX** page 16

	Terminal Support Parameters				Trunk Interfaces DS1, DMI, CPI*	Local-Area Net Interfaces	Modem Pooling	Notes
	Asynchronous	Synchronous	Half or Full Duplex	Terminal Interfaces				
Rolm Corp. *CBX-11*	19.2K bit/sec	64K bit/sec	Full	RS-232C	DS1 DMI - considering CPI - yes	N/O	Yes	Terminals interfaced in phone, at phone or in stand-alone box.
Intecom, Inc. *IBX S10, S80*	56K bit/sec	56K bit/sec, 10M bit/sec burst rate mode	Full	RS-232C, RS-449, V.35, Ethernet 15 pin D-cable, IBM category A prods.	DS1 DMI, CPI planned	N/O	Yes	Lanmark - internal Ethernet-type network terminal interfaces in phone, at phone or stand-alone.
NEC Telephone, Inc. *Neax 2400*	19.2K bit/sec	56K bit/sec	Full	RS-232C, RS-449, V.35	DS1 DMI, CPI - evaluating will support one	N/O	Yes	Terminal interfaces stand-alone only.
Siemens Communications Systems, Inc. *Saturn II, III*	19.2K bit/sec	N/O	Full	RS-232C	N/O	N/O	Yes	Terminal interfaces stand-alone only.
Northern Telecom Ltd. *SL-1, SL-100*	19.2K bit/sec	56K bit/sec	Full	RS-232C RS-422	DS1 CPI	N/O	Yes	Terminals interfaced in phone, at phone or stand-alone.
AT&T Information Systems *System 85*	64K bit/sec	64K bit/sec	Full	RS-232C	DS1 DMI CPI - not now	N/O	Yes	Protocol conversion — AT&T BCT 500 & 515 terminals can emulate IBM 3278, 2780 & 3780 RJE, TTY-type terminals.
Mitel Corp. *SX2000*	9.6K bit/sec	19.2K bit/sec	Full	RS-232C	None	N/O	Yes	"Virtually nonblocking" equates with one call blocked in 100.
GTE *Omni Series S1, S2, S3*	19.2K bit/sec	64K bit/sec	Full	RS-232C V.35	DS1 DMI, CPI evaluating	Through X.25	Yes	"Virtually nonblocking" equates with one call blocked in 100.
Solid State Systems, Inc. *Jr. Exec*	9.6K bit/sec	N/O	Full	RS-232C	None	N/O	Yes	Terminal interfaces stand-alone only.
Ztel, Inc. *Private Network Exchange*	19.2K bit/sec	56K bit/sec	Full	RS-232C	DS1 will support both DMI, CPI	N/O	Yes	Has internal local-area network presently used for system control, will provide for high-speed data later.
CXC Corp. *Rose*	19.2K bit/sec	64K bit/sec	Full	RS-232C	None	N/O	Yes	Has internal local-area network presently used for system control, will provide for high-speed data later.

N/A - Not Available
N/O - Not Offered
* Trunk Interfaces — DS1 is the machine interface for 1.54M bit/sec T1 carrier facilities. DMI (AT&T's Digital Multiplexed Interface) and CPI (Northern Telecom/Digital Equipment Corp.'s Computer-to-PBX Interface) are used to connect computer to PBXs.

CW chart

PRODUCT SPOTLIGHT

Why you might not need a digital PBX

One of the appealing aspects of switching data with in-house telephone facilities is that telephones and their gray wire are ubiquitous in nearly all organizations.

But you do not need a modern digital private branch exchange (PBX) to exploit that fact.

Simply by using modems, any office telephone system can be used to switch data within an organization. This does, however, tie up two telephone extensions, and, during busy hours, it can sap the capacity of the switching system, resulting in the inability to get a dial tone.

Notwithstanding those drawbacks, this approach can still be used effectively to get around the installation of dedicated wiring for occasionally used devices, providing the number of devices supported in this manner is limited.

If that sounds too risky, there are other approaches that take advantage of the installed telephone wire but avoid the switching apparatus. These alternatives obviate the need to support equipment by running dedicated wires that, in the case of coaxial cable, cost $3 to $7 per foot.

The DCS-2 Data Carrier System manufactured by Teltone Corp. of Kirkland, Wash., is typical of the products of this ilk also available from, among others, Micom Systems, Inc. and Gandalf Data, Inc. The DCS-2 uses data-over-voice technology to support asynchronous data simultaneously at speeds up to 9,600 bit/sec and voice conversations over a single twisted-pair telephone wire.

In application, a desktop device provides an RS-232 interface for terminal equipment and an RJ-11 modular jack to connect the telephone. The interface, which connects to any standard telephone wire, superimposes the data stream from the terminal equipment onto a frequency higher than that used to carry the voice signal.

In the PBX room, a similar device is used in re-

See **NEED** page 16

Users exhibit range of enthusiasm

Manufacturers of private branch exchanges (PBX) that can handle both voice and data admit that very few of their users ever tap their switches' data-handling capabilities. The few that do vary in their enthusiasm.

The University of Chicago installed three Intecom, Inc. IBX S40s two years ago to replace its Centrex system. Besides their usual jobs of switching voice, the Intecom devices now support most of the university's terminals.

Patricia Todus, the school's manager of telecommunications, said that much, although not all, of the dedicated coaxial cable facilities once used to support the campus' terminals has been removed since the PBXs were put in place. The PBXs link roughly 8,300 asynchronous and synchronous terminals to a number of host computers, including hardware from IBM and Digital Equipment Corp.

The University of Chicago has one Ethernet local-area network. As others are deployed, Todus said, the school intends to link them with the PBX.

At Westinghouse Electric Corp. in Pittsburgh, data is being switched through the new PBXs that are being installed as the company moves to integrate voice and data. "Given the growth in data applications and the need for information exchange," said Bob Bennis, manager of communications systems, voice and data integration with a PBX "seems like a sensible and easy way to go. Why have separate voice and data networks?"

The down side of integration, Bennis pointed out, is that "if you lose a switch you lose an awful lot." So integration is not being pursued haphazardly at Westinghouse.

"We're not ripping things out to say we have integration," Bennis said. "The direction we're going in manufacturing and in the office suggests that you want to have a wire facility that enables you to use terminals and personal computers to the fur-

See **USERS** page 16

CPU, PBX vendors drawing alliances

The alliances being drawn between manufacturers of computers and manufacturers of voice/data private branch exchanges (PBX) are indicative of a growing belief that the digital telephone switch will play an important role in future intraoffice data communications.

IBM and Wang Laboratories, Inc. believe it, as can be presumed by their respective moves to acquire pieces of switch manufacturers Rolm Corp. and Intecom, Inc. (see story page 13).

Other computer manufacturers believe it, too. Over the past year, many reached agreements with various PBX vendors to certify compatibility between their products. Some of the notable testing agreements include:

- Northern Telecom, Ltd. with Digital Equipment Corp., Wang, Prime Computer, Inc., Hewlett-Packard Co., Data General Corp. and Sperry Corp.
- AT&T Information Systems with Wang, HP, DG and Honeywell Information Systems.
- Rolm with HP, DEC and DG.

Switch manufacturer Intecom said that with some interaction of the various computer makers, it has developed interfaces for products from Wang, DG, DEC, IBM, HP and Prime. Vendor companies in both the computer and PBX camps are also now studying the computer/PBX interfaces that have been recommended as standards to the Electronic Industries Association by the teams of Northern Telecom/DEC and AT&T/HP. Those interfaces, which are incompatible, specify the number of channels and the type of control signaling used to connect a computer to a PBX through one of its 1.54M bit/sec trunk interfaces [CW, April 2].

Northern Telecom/DEC's Computer-to-PBX Interface (CPI) has the endorsement of computer vendors Wang, DG and Prime and the support of switch makers Rolm, Mitel, Inc. and Intecom.

AT&T's recently announced Digital Multiplexed

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	Architecture	Required Environment	Maximum # of Ports	Nonblocking for how many lines	Telephone Sets Supported	System Wiring	Price/Line	Protocol Conversion
Rolm Corp. *CBX-II*	Modular switch with distributed architecture based on TDM bus	Switchroom	24-10,000	All	Digital, Analog	1 pair - twisted, recommend 3 pair	$800-$1,000	Asynch. to BSC, SDLC & X.25
Intecom, Inc. *IBX S10, S80*	Modular switch with distributed architecture and central control based on TDM bus	Switchroom	S10: 250-2,000 S80: 1,500-8,200	All	Digital, Analog	2 pair - twisted	$1,000	Asynch. to BSC & X.25
NEC Telephone, Inc. *Neax 2400*	Modular switch with distributed architecture based on TDM bus	Switchroom	184-23,184	All	Digital, Analog	2 pair - twisted	$600-$1,200	N/O
Siemens Communications Systems, Inc. *Saturn II, III*	Fixed size switch based on TDM bus	Office	II: 224 III: 992	All	Digital, Analog	2 pair - twisted	N/A	None of these
Northern Telecom Ltd. *SL-1, SL-100*	Modular switch with distributed architecture and centralized control based on TDM bus	Switchroom	SL-1: 32-5,000 SL-100: 5,000-30,000	1,800 lines in max. configuration of SL-1 All for S1-100 if wanted	Digital, Analog	2 pair - twisted	$600-$1,000	Asynch. to BSC, SDLC
AT&T Information Systems *System 85*	Modular switch with distributed architecture based on TDM bus	Switchroom	400-7,000	Totally nonblocking for 4,000 lines, or "essentially nonblocking"	Digital, Analog	Recommend 4 pair twisted	N/A	See notes
Mitel Corp. *SX2000*	Modular switch with distributed architecture based on TDM bus	Office	400-3,500	"Virtually non-blocking" for all lines	Digital, Analog	2 pair - twisted, recommend 3 pair	$800-$900	N/O
GTE *Omni Series S1, S2, S3*	Modular switch with distributed architecture and central control based on dual TDM bus	Switchroom	50-3,000	"Virtually non-blocking"	Analog	1 pair - twisted	$700 parity speed	Asynch. to X.25 conversion
Solid State Systems, Inc. *Jr. Exec*	Modular switch based on multiple TDM buses	Office	4-256	All	Analog	2 pair - twisted	N/A	N/O
Ztel, Inc. *Private Network Exchange*	Modular switch with distributed architecture using time/space/time division	Office	150-20,000	All	Digital, Analog	2 pair - twisted	$800-$1,000	N/O
CXC Corp. *Rose*	Modular switch with distributed architecture based on TDM bus	Office	192-12,000	1,000-3,400	Digital, Analog	2 pair - twisted	N/A	N/O

N/A - Not Available
N/O - Not Offered

CW chart

NEWS

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ous implementation problems with integrating voice and data." According to Frank, "They don't always play well together, like trying to play 45 rpm and 33⅓ rpm records together."

Voice and data traffic differ — although both exist in digital form within a digital PBX — in permissible error rates (digitized voice does not require the low bit-error rates needed for data), frequency of access and typical duration per session of use.

Angus commented that while traditional data "conversations" are longer in nature than voice conversations, he has found that personal computer data traffic is similar in duration to voice conversations and has "less of an affect on PBX traffic than dumb or intelligent tubes."

Killorin presented another opinion, cautioning that personal computer communications sessions are not always short-lived. "A PBX can be tied up if users are doing a lot of printing on remote devices or using the switch to access remote storage devices frequently," he noted.

User requirements are not static, however. As higher capacity disk drives are hung from personal computers, their users will find more occasions to try to pull larger hunks of data through the PBX.

To meet those evolving needs, Angus believes that PBX manufacturers will eventually have to support 256K bit/sec, a speed that would enable a single megabyte file to be transferred in roughly four seconds.

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verse to strip the data signal off the wire and provide an appropriate computer connection. The data stream never passes through the PBX.

The per channel, end-user cost for a typical system supplying support of asynchronous traffic to 9,600 bit/sec is $450, according to a Teltone spokesman. Reportedly, Teltone has sold upward of 30,000 DCS-2 channels.

A synchronous version of the DCS-2 system that supports traffic at 19.2K bit/sec is said to be in field trial.

Davox Communications Corp. of Merrimack, N.H., also markets products that take advantage of existing telephone wiring, although its system can only be used with its proprietary terminals. Collectively known as Davoxnet, the terminals have built-in telephones and can operate as an IBM 3278 Model 2 terminal, a DEC VT100 or a teletypewriter-type asynchronous terminal. Additionally, the terminals can communicate with IBM Personal Computers. Users can reportedly switch between modes of operation with the push of a button.

Instead of using data-over-voice technology to offer simultaneous support for data like Teltone, Davox pushes data over the unused wires that run up to the back of every telephone. Telephones typically use only two of the six wires run through a building.

Davox, like Teltone, picks up the twisted pair used for data in the PBX room, the central point where all telephone wires are gathered, and routes them to an appropriate device.

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thest extent possible."

The PBX can provide that flexibility and is doing so at Westinghouse where the need arises. Bennis noted, however, that he hasn't found any need to use the 56K bit/sec data capability of some GTE Corp. PBXs the company has. "Where we need those speeds," Bennis said, "we are already providing support with dedicated wires."

At Ford Motor Co. in Dearborn, Mich., only a small number of the 300 or so PBXs located throughout the company are carrying data. The little data switching that is done is generally at 9,600 bit/sec between terminals and computers, according to Mayford Roark, executive director of systems.

Access to multiple resources

At Schwinn Bicycle Co. in Chicago, the PBX is regarded as a possible means to provide computer users with transparent access to multiple resources. Bob Walsh, director of MIS, said Schwinn will be installing a PBX within a year to replace the Centrex service it currently has. The company is presently investigating the PBX as a method of delivering voice and data integration, Walsh said.

Hills Bros. Coffee, Inc. in San Francisco, has no big plans to switch data through its three-year-old Hitachi America Ltd. PBX.

Roger Prow, manager of telecommunications, said that the company has "more than 100 terminals that are already cabled and have been that way for years"; that while his switch could probably support some of them, Hills Bros. doesn't "need to use it that way."

The company did need to be able to access different computer resources from the same stations, but instead of turning out the voice switch to install new PBXs, Hills Bros. installed a Micom Systems, Inc. data switch in the computer room.

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Interface for the same application has been backed by HP (formerly a CPI supporter), DG and Honeywell and is reportedly being studied by PBX manufacturers Rolm, NEC Telephone, Inc., Intecom, and GTE Business Systems Corp.

UNIX & C

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Oklahoma joins states enacting computer crime bills

By John Gallant
CW Staff

OKLAHOMA CITY — High-technology crime has become an extremely risky business here, thanks to a recently implemented law that puts Oklahoma among the growing number of states to enact anti-computer-crime legislation.

Signed into law March 29 by Gov. George Nigh (D-Okla.), the Computer Crimes Act was backed by a coalition of industry and law enforcement groups in the state. The legislation met with unanimous approval by both houses of the state legislature where it was introduced in mid-January, according to its author, Sen. Robert Hopkins (D-Tulsa).

Hopkins was assisted in drafting the legislation by David Holland, president of Tulsa-based Holland Research Laboratories, Inc., and Tulsa Assistant City Attorney Linda Childers; it was cosponsored by Rep. Jim Henshaw (R-Tulsa). Legislators added an "emergency clause," which stipulated that the bill take effect immediately after its signing by the governor.

Categories of crime

The law, similar to legislation proposed recently in Massachusetts [CW, April 9], creates two categories of computer crime. Aimed at "professional" computer criminals, the first portion of the law makes it a felony to damage, modify, alter, copy, disclose or take possession of a computer system or network. Those convicted under this section face fines ranging from $5,000 to $100,000 and imprisonment in a state penitentiary for one to 10 years.

The law's second section makes it a misdemeanor to access or attempt to access a computer system or network. Intended to discourage hackers, the misdemeanor portion calls for up to $5,000 in fines and up to 30 days' imprisonment in a county jail.

Hopkins said the impetus behind passage of the law was a lack of legal safeguards for the state's computer users. "We had no laws to effectively prosecute people who have the potential to do a tremendous amount of damage. We wanted to make a strong statement that we were against this type of activity," he said.

"We were strongly supported by the construction, oil and banking industries and the state's district attorneys, and we incorporated their recommendations into the bill," Hopkins added. "We also utilized some portions of the federal bills we looked at to make this a law with some teeth. It is probably going to be a model for other states."

According to Hopkins, one of the groups most closely involved in passage of the law was the state's Computer Crime Action Association, Inc. (CCAA), headed by Childers. A nonprofit political action committee lobbying for computer crime legislation, CCAA helped draft the law's specific technical language. The organization has also offered to educate law enforcement agencies in gathering evidence of computer crime and prosecuting offenders.

Both Hopkins and Holland told *Computerworld* that the law was designed to make Oklahoma more attractive to high-technology companies. Hopkins said a "major computer manufacturer," which he declined to name, had tracked the bill's progress and was considering relocating to the state as a result of its passage.

Holland, who described Holland Research Labs as an electronics research and development firm, said, "We needed safeguards for our products. Before this law, the only protection we had for our software products was the federal copyright laws. The state law provides protection without the backlogs and delays that are involved in bringing a federal suit against an offender."

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NEWS

This DP auditing job calls for more than auditing

Medical insurer requires winning personality, writing ability

By David Myers
CW New York Bureau

NEW YORK — While many Fortune 500 corporations here go begging for senior systems analysts, Blue Cross and Blue Shield of Greater New York faces a special problem: finding programmer analysts with a knowledge of accounting combined with a winning personality and an ability to write.

Why does New York's largest health insurer need programmers with such a special blend of skills? To examine and check the work of other programmers and systems analysts, that's why.

"That's our job," noted Francis X. Fee Jr., the new assistant vice-president in charge of auditing at Blue Cross/Blue Shield.

"We say, 'We're from EDP auditing, and we're here to help,' and [the data processing professionals] just laugh. There are three great lies of man, you know, and that's the third one," Fee said.

Fee was named to head the auditing operations last October after serving as director of financial evaluation and control for the New Jersey Casino Control Commission. A certified public accountant, he began his career with Deloitte, Haskins & Sells, one of the Big Eight accounting firms.

Staff of 19

Blue Cross/Blue Shield's auditing division encompasses program security, internal auditing and DP auditing.

Its DP auditing staff of 19, under director Eugene Assante, has the job of keeping track of the 1,100 DP workers, five mainframes, 27 minicomputers and nine word processing units at the health insurance carrier.

"Only on occasion do we recommend that they replace a system," Assante said.

"But we never suggest a specific piece of hardware to improve their work. That's outside our purview. They've spent their lives doing hardware evaluation. To take that decision away from them would be presumptuous," he said.

Moreover, he pointed out, if a DP auditor becomes "seduced by the decision-making process, it's very hard to come in later and judge [the system's] effectiveness."

By its very nature, auditing breeds a certain amount of tension, as anyone who has ever been audited by the Internal Revenue Service well knows. At Blue Cross/Blue Shield, a DP auditor shows up in the data center hand-in-hand with a coworker, an internal auditor.

"Both guys show up at once, and the guy [who is being audited] panics," Assante laughed.

That tension, however, is fueling the growth of DP auditing as a profession.

"We're not looking for exactly the same qualities [as in a DP employee] when we hire a DP auditor. But he has to know DP. [The data processing managers] will run right over you if they think they can get away with it," Assante said.

Assante listed several areas of knowledge he considers essential for an adept DP auditor: Cobol, PL/I and OS/JCL. But, he complained, "none of the colleges seem to teach OS/JCL any more. It takes us 35 hours to teach someone."

Assante expects a newcomer to his DP auditing team to be familiar with data base management, preferably Cincom Systems, Inc.'s Total system, which has been adopted by Blue Cross/Blue Shield.

The DP auditor should know system design as well.

Fee added that the health insurer is searching for people with both DP knowledge and accounting skills, plus "the right personality for dealing with persons who are often a bit defensive." The DP auditor should also be able to write, since an audit of the data center results in a written report.

Hard to find

Who has such a blend of talents? Assante admitted such employees are hard to find, and the shortage of qualified personnel has been delaying his staff's reports by up to three months.

Fee mentioned a summer internship program arranged for students at New York University, but Assante seemed to believe that most good candidates will drift over from the DP department. Assante himself is a trained programmer.

"If you're a DP manager, you have 100 people working under you, and that's good for your ego. But you also have to do a lot of fire fighting. Here [in DP auditing] you can get things done. Plus, for the first time, you can step back and see the whole operation. That's the real enticement," Assante said.

Two indicted for smuggling high-tech equipment to Asian nations

LOS ANGELES — A San Diego area businessman and a Hong Kong man have been indicted by a Los Angeles federal grand jury on charges of smuggling computer calibrating and testing equipment to several Asian nations, including the People's Republic of China.

The 17-count indictment, handed up earlier this month, charges William T. Newkirk, 46, president of Kal Tek Labs, Inc., with eight counts of failing to gain required export licenses for the equipment and eight counts of filing false statements with the U.S. government regarding the contents of those alleged shipments.

Newkirk allegedly shipped the equipment to Hong Kong businessman Man Chung Tong, who, in turn, allegedly sold it to buyers in the Philippines, Malaysia, Hong Kong and the People's Republic of China.

Assistant U.S. Attorney William F. Fahey placed the value of the equipment at "hundreds of thousands of dollars," but would not specify the models of the products that were allegedly shipped.

Among the companies from which Newkirk allegedly purchased the equipment are Hewlett-Packard Co. and Tektronix, Inc.

Newkirk, according to press accounts, surrendered to federal authorities in Los Angeles April 6.

Tong, who also faces eight counts of failing to obtain an export license, was expected to surrender shortly afterward.

Fahey said Newkirk's alleged shipments to Tong were carried out between September 1982 and August 1983 and were uncovered as part of the U.S. Customs Service's Operation Exodus, an attempt to stop the flow of high-tech equipment to the Soviet-bloc nations and the People's Republic of China.

None of the shipments was confiscated before leaving the U.S., Fahey said.

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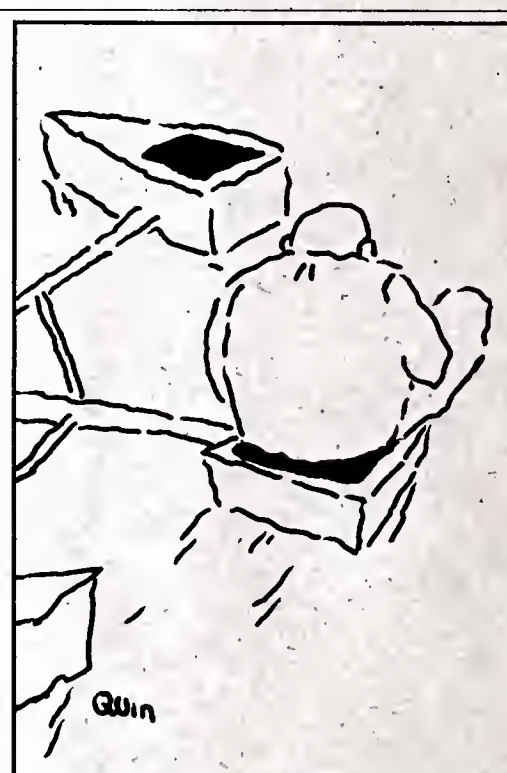

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Standards lack, misconceptions hinder AI boom: speaker

By Tom Henkel
CW Staff

BOSTON — Confused by a lack of standards and possibly suffering from misconceptions over the results they might achieve, users often do not know what to expect from artificial intelligence products. As a result, many settle for too little or expect far too much from an AI system.

That was the opinion of one consultant who pointed out during a conference here last week that many issues have to be resolved before AI leaps to the forefront of the information processing industry.

Like other speakers at the Artificial Intelligence Conference, sponsored by the Data Processing Management Association's Education Foundation, Dr. John H. Clippinger, president of Brattle Research Corp., a Cambridge, Mass., consulting firm, said the market for AI products will boom. But such an explosion may be delayed until the AI industry overcomes some early growing pains.

Severe identity crisis

For example, Clippinger said, makers of AI products suffer from a severe identity crisis. The term "AI" is used to cover several different industries including natural languages, expert systems, vision systems, voice recognition systems and intelligent robots. It is unlikely, if not impossible, for any one vendor to offer products aimed at all market segments, Clippinger said.

Furthermore, he noted, many potential corporate users of AI products have yet to be convinced that AI is the only way to solve a particular business problem. Consequently, many turn to conventional computing in efforts to solve their business problems instead of bearing the cost and uncertainty of an AI project.

When faced with the relatively high hardware and software costs associated with AI, some users who do experiment with it skimp on development and wind up with an application that is not very useful, Clippinger said.

But an identity crisis is not the only problem facing early vendors and pioneer users of AI products, according to Clippinger. He noted that there are virtually no standards in the burgeoning AI industry. For example, he said, there are at least nine versions, or dialects, of Lisp, a popular language for AI software development. Most of those dialects possess enough differences to make it very difficult to convert an application from one dialect to another.

Clippinger also stated that since none of the major computer system vendors — like IBM, Digital Equipment Corp. or Hewlett-Packard Co. — has formally jumped into the AI market, the lack of standardization will probably continue until a major firm sets a de facto standard.

CAD/CAM guide out

ARLINGTON, Texas — Approximately 190 attributes of computer-aided design and manufacturing (CAD/CAM) systems are compared to more than 40 CAD/CAM system suppliers' offerings in the *CAD/CAM Presentation Resource Guide* published by the University of Texas at Arlington.

The 400-page, loose-leaf guide covers such topics as CAD/CAM graphics systems, group technology, computer-aided process planning, numerical control, manufacturing management systems, robotics and automated storage and retrieval systems.

The guide costs $125 from the Office of Continuing Education, University of Texas at Arlington, Arlington, Texas 76019.

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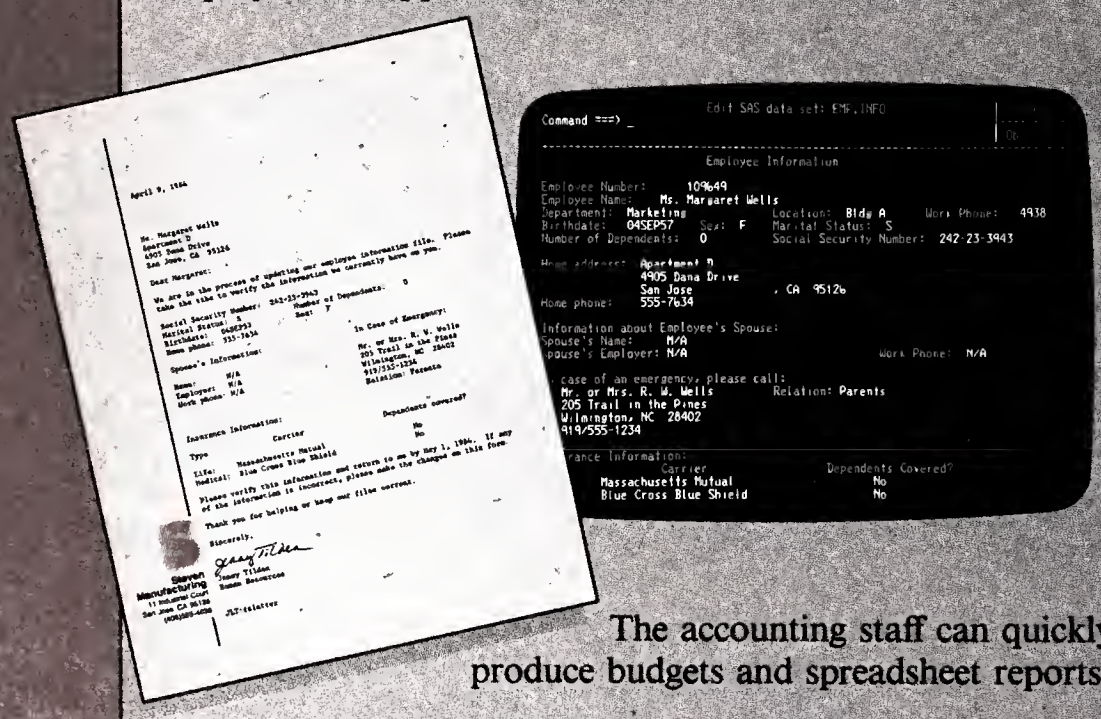

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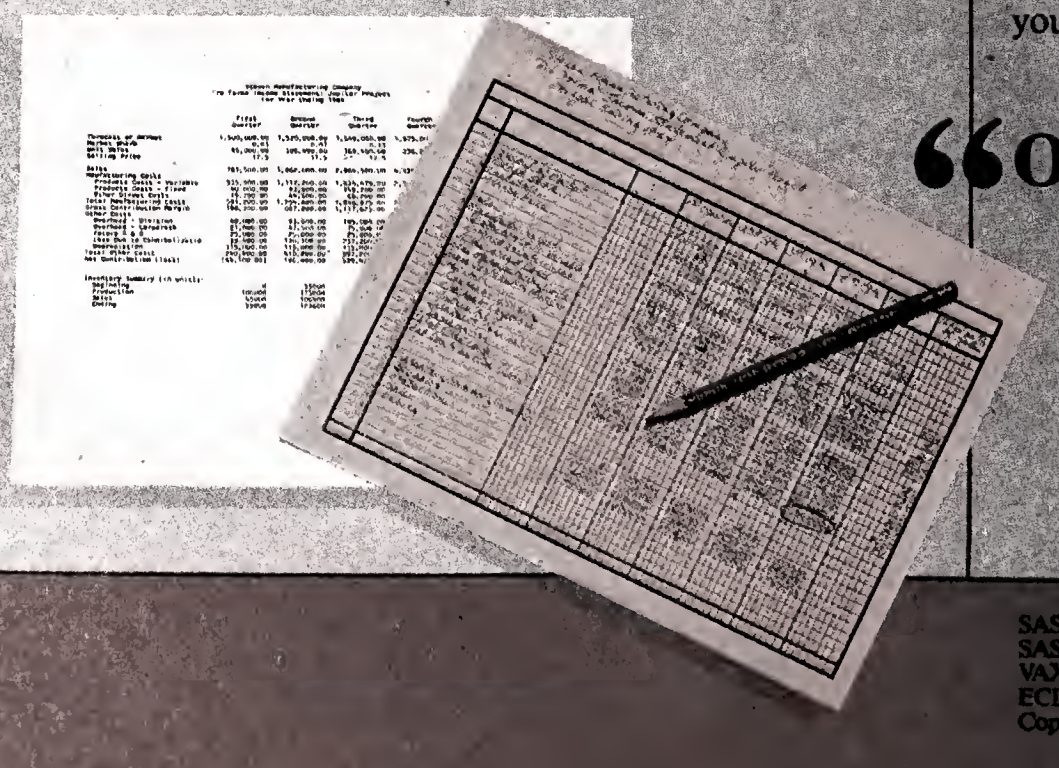

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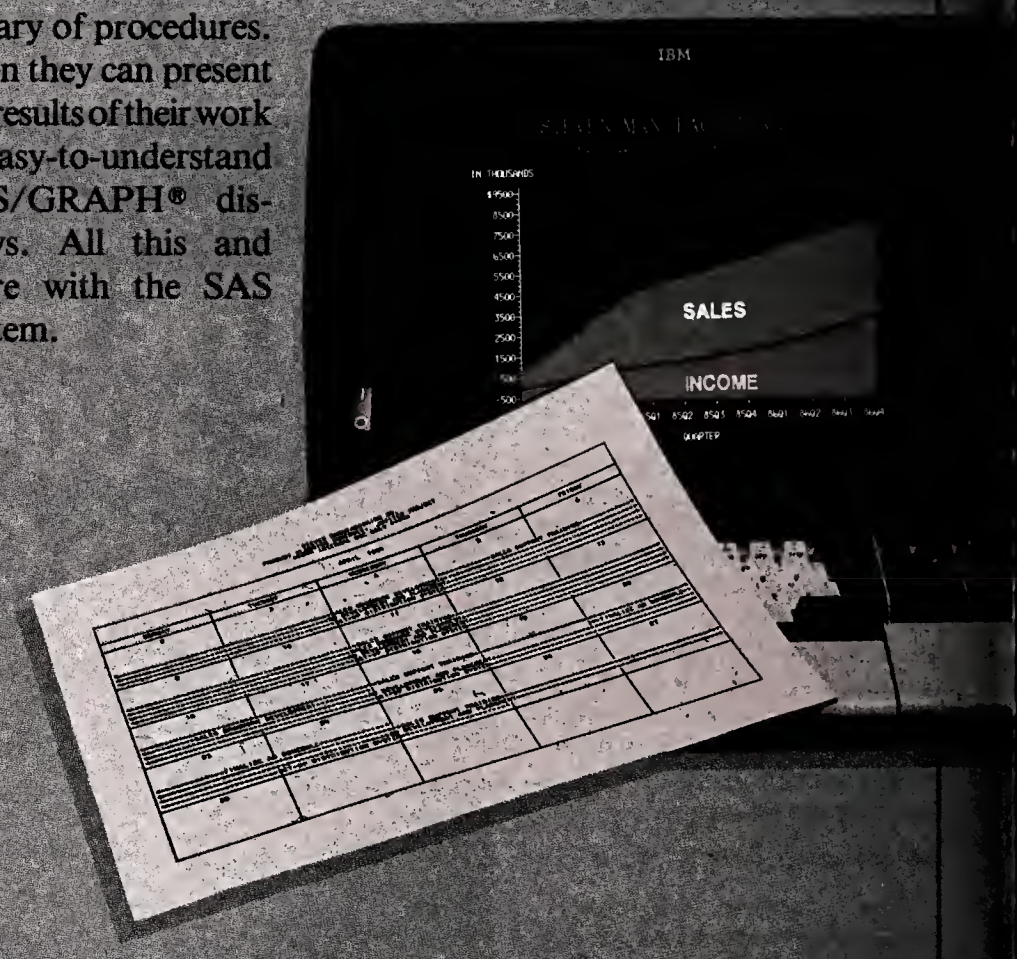

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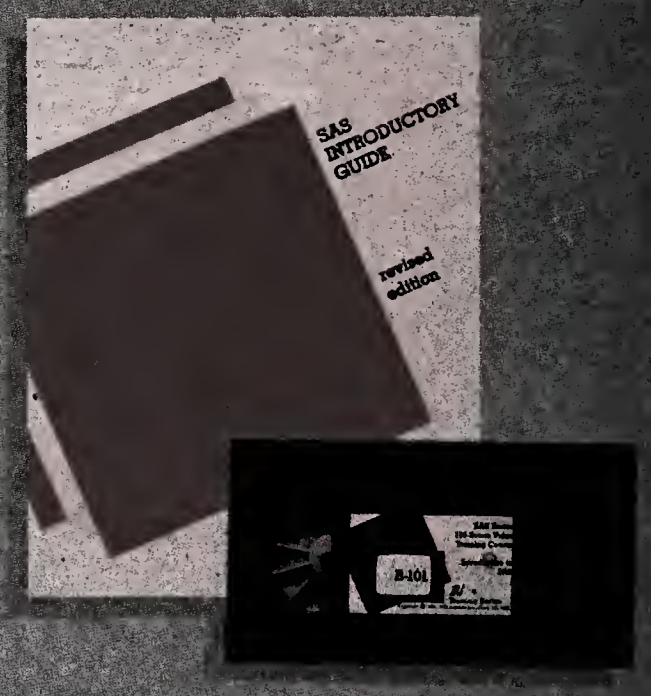

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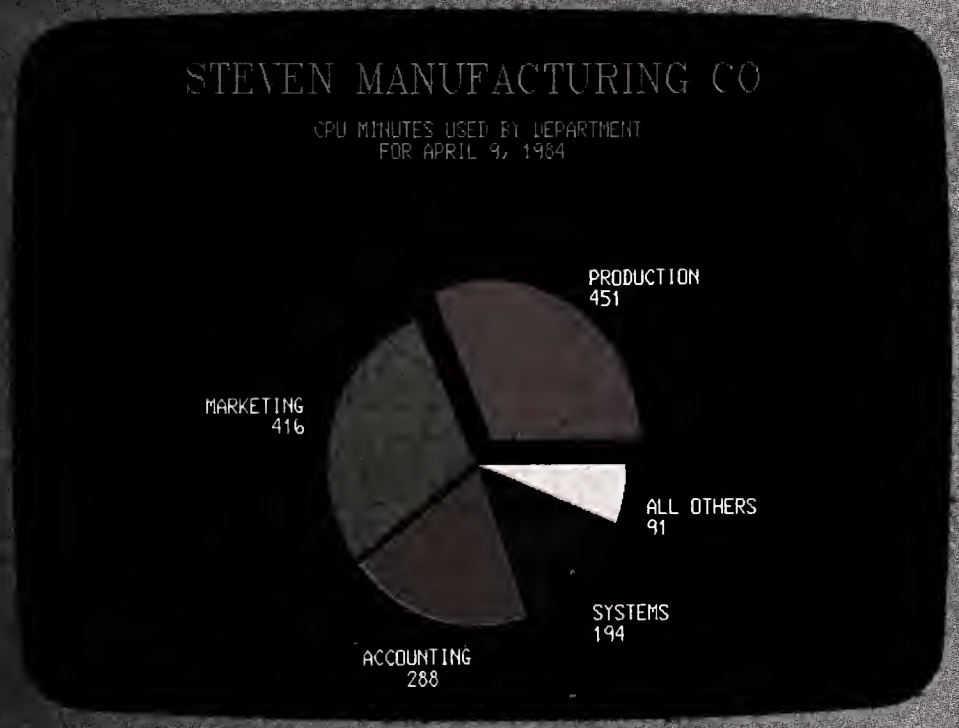
		CPU MINUTE			I/O COUNT	
DEPARTMENT	JOBNAME	NUMBER OF EXECUTIONS	SUM	MEAN	SUM	MEAN
ACCOUNTING	JACCT110	3	31.32	10.44	11372	3791
	JACCT210	7	38.97	5.57	34968	4995
	JACCT220	8	103.95	12.99	74237	9280
	OTHERS	25	113.76	4.55	56085	2243
HUMAN RESOURCES	OTHERS	16	31.00	1.72	50314	2795
LEGAL	OTHERS	16	17.00	1.06	8218	514
MARKETING	JMKT0170	3	31.35	10.45	13557	4519
	JMKTG200	9	145.36	16.15	159131	17681
	JMKTG215	8	82.33	10.29	43748	5469
	JMKTG220	7	67.01	9.57	132357	18908
	OTHERS	21	89.95	4.28	100880	4804
PLANNING	OTHERS	17	43.00	2.53	27479	1616
PRODUCTION	JPROD200	12	80.67	6.71	107271	8939
	JPROD500	7	170.00	24.29	89020	12717
	JPROD650	4	58.35	14.59	91561	22890
	OTHERS	24	142.18	5.92	108352	4515
SYSTEMS	JSYS525	4	38.47	9.62	22519	5630
	JSYS620	4	24.62	6.15	39212	9803
	JSYS700	4	47.36	11.84	41790	10445
	JSYS850	4	49.67	12.42	40256	10064
	OTHERS	17	33.88	1.99	116291	6723
ALL JOBS		222	1440.00	6.49	1366608	6156



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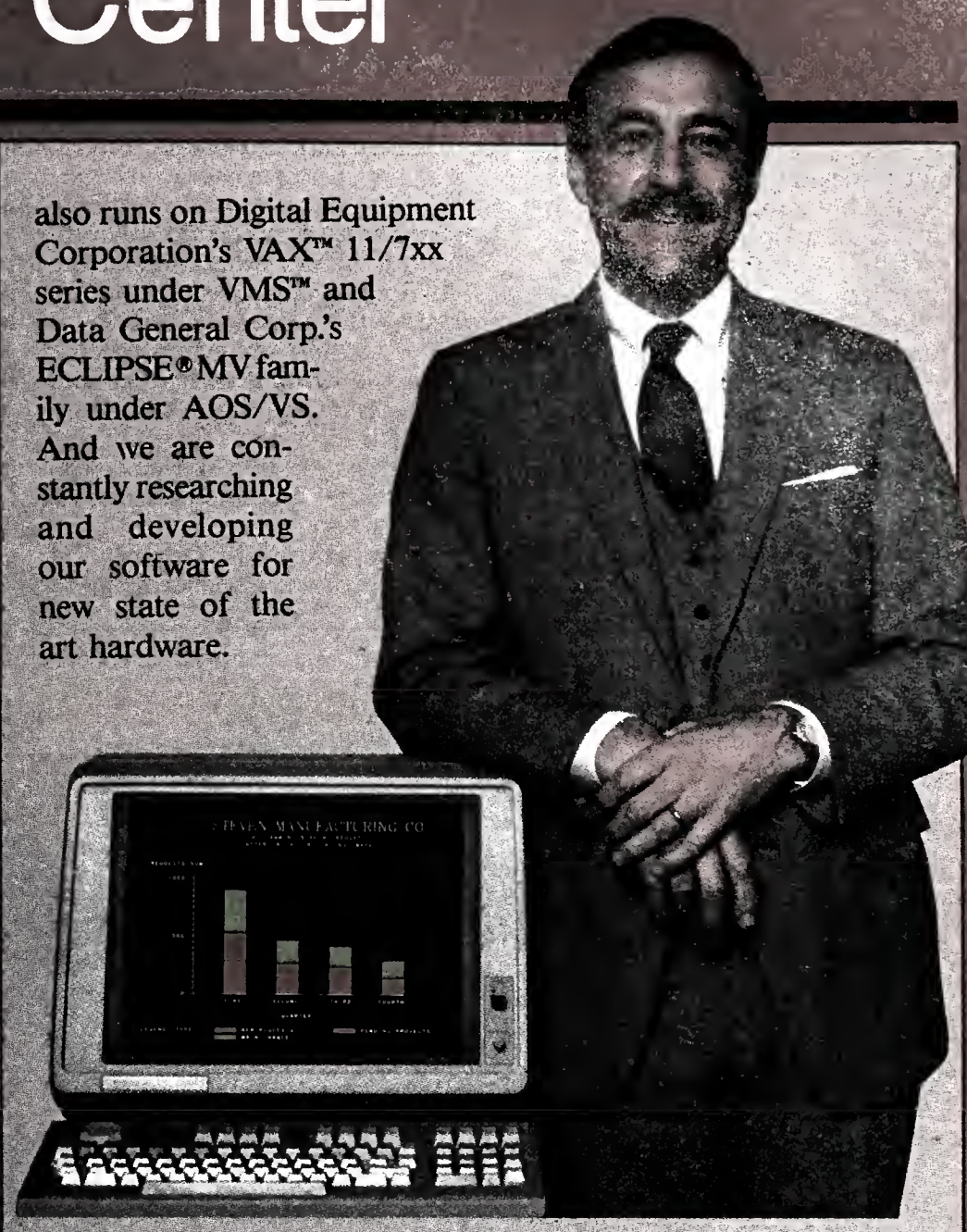

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NEWS

Nata asks FCC to control 'chaos' in telephone marketplace

By Bryan Wilkins
CW Washington Bureau

KANSAS CITY, Mo. — A leading national trade association last week accused the Federal Communications Commission of adopting a blind-faith approach to deregulation while the telephone marketplace is "escalating into chaos" four months after the divestiture of AT&T.

The "telecommunications marketplace is a mess," according to the North American Telecommunications Association (Nata), which represents 600 independent telephone equipment manufacturers. "Customers are facing increasing delays in receiving timely service, sometimes having to wait for two months or more for the phone companies to provide the long-distance connections they used to receive in a matter of weeks.

"The ruinous price wars that have plagued the communications equipment and computer industries for the past two years are accelerating ... sparked by the aggressive reentry of the divested Bell operating companies into the equipment market and the 'fire-sale' of in-place AT&T products," Nata President Edwin Spievack said recently in a speech to the Mid-American Telecommunications Association here.

Spievack said that federal and state policymakers are scrambling to get a hold on the chaotic situation, but are not succeeding. Instead, they are delaying the implementation of access charges while they search for new initiatives.

Spievack likened the present competition in the telecommunications markets to the situation that existed in the early 20th century, when "the business environment was a jungle, dominated by giants." He called for a new, competitive environment that "strikes a rational balance between pervasive regulation of government franchised monopolies, which characterized our past, and laissez-faire, cutthroat competition, which is fast becoming our future."

Spievack said that the presiding federal judge in the U.S. vs. AT&T antitrust trial has a vision of divestiture "which means simply a landscape dominated by Goliaths, a series of *Star Wars* clashes between AT&T, the divested Bell operating companies, IBM and ... a few others."

He called for the FCC and the court to require that the divested Bell operating companies devote their primary attention to the provision of local telephone service before rushing into "the riskier markets for business equipment, enhanced data services, long distance and even commercial real estate."

Specifically, Spievack called on the FCC to establish a national service center that would be responsible for ensuring that telephone customers are getting the delivery of telephone service universally, uniformally and efficiently.

"Given the escalating chaos in the industry, it's time for the commission to get off the sidelines and take affirmative, aggressive steps to ensure that all users receive the basic service they need ... which must include the monitoring on a national basis of the service performance by bottleneck suppliers, with particular attention to trouble spots," Spievack said.

At the same time, Spievack said that the cutthroat price competition will produce destructive results and cripple the very industries on which America depends. He called on Congress to investigate the issue.

Lottery to grant radio licenses

WASHINGTON, D.C. — Most of the remaining cellular radio franchises in the nation will be awarded by lottery, the Federal Communications Commission decided earlier this month.

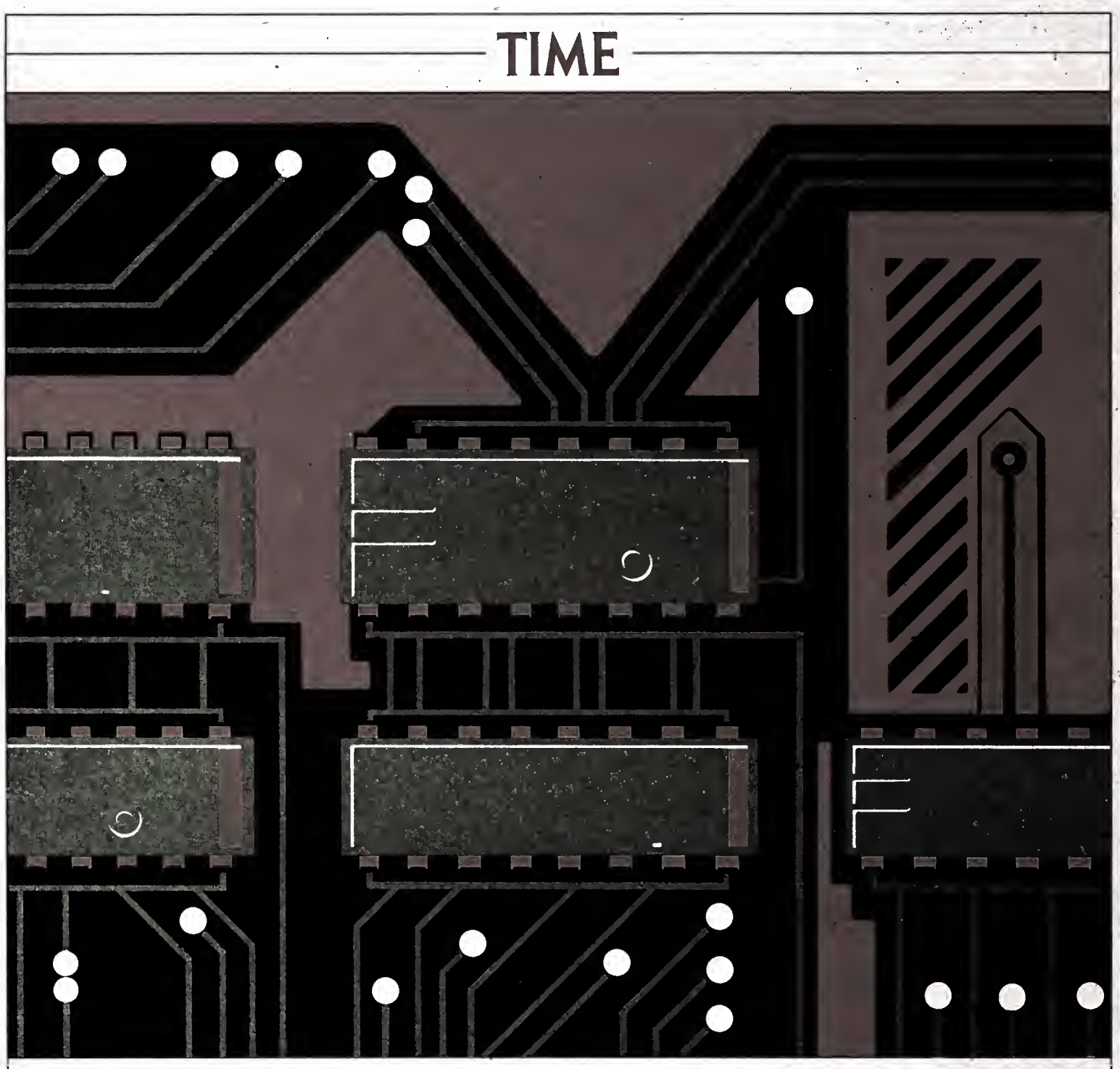
The FCC also decided that its wire-line set-aside policy, which has been applied so far only to the 30 largest ("top 30") cellular radio markets, will be extended to smaller markets. Under this policy, half the available cellular radio frequencies are reserved for telephone companies and the other half for nontelephone companies.

The lottery process, by speeding up award of cellular radio licenses, will bring service to the user in less time, the FCC said. It cited four other reasons for deciding not to award licenses in markets below the top 30, one being the expense of the comparative hearing process.

A lottery also will "permit different system approaches to compete in the marketplace rather than in the hearing room," the FCC added.

The wire-line set-aside policy is being extended, the FCC said, because it will assure large and small telephone companies of an opportunity to compete.

"Without separate allocations ... the odds ... would favor the more numerous non-wire-line applicants as a group, making significant wire-line participation unlikely," the FCC said.



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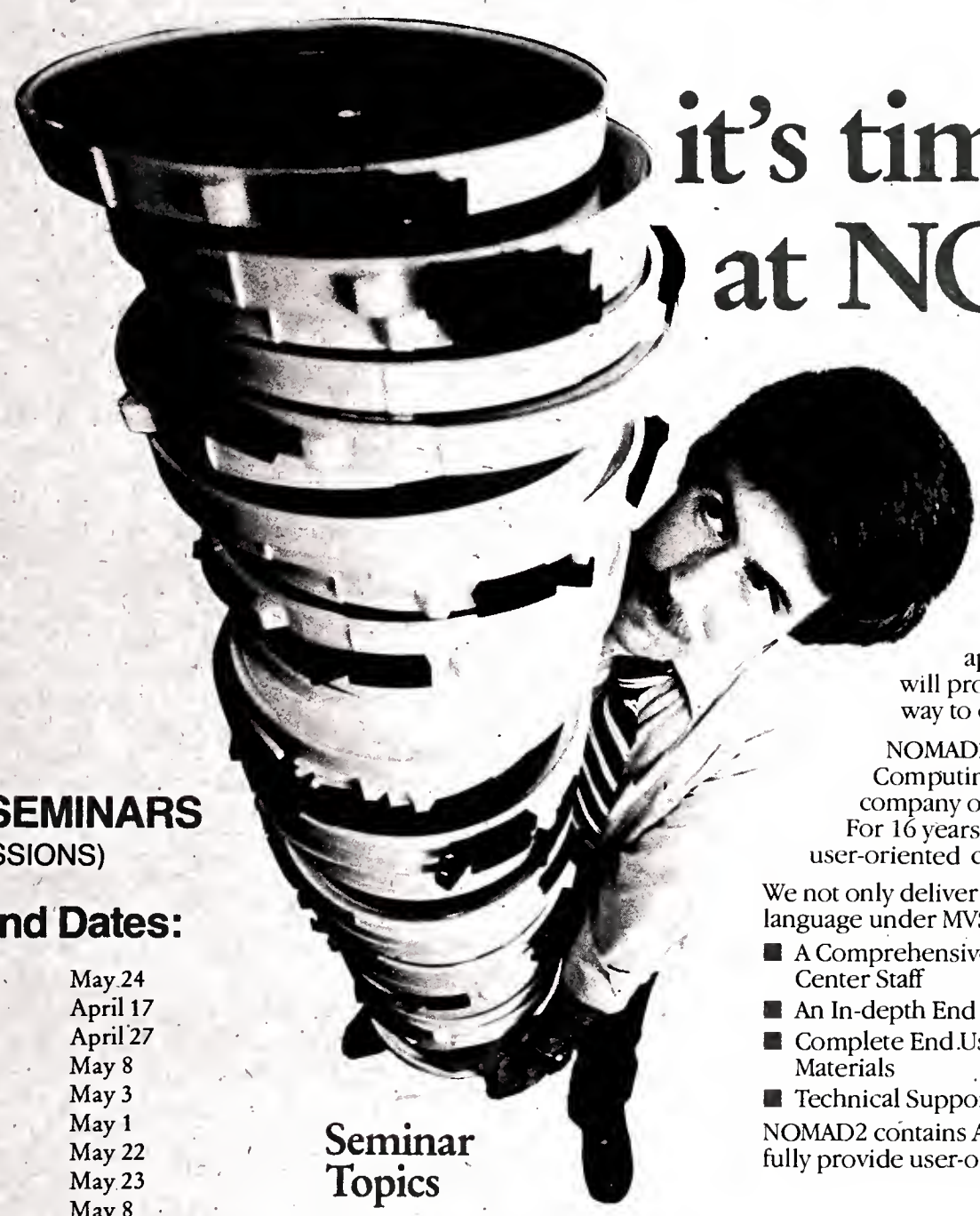

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NEWS

DPers see Hart, Reagan supporting high-tech industries

Unemployment, inflation, federal deficit primary issues for those polled

By Jake Kirchner
CW Washington Bureau

WASHINGTON, D.C. — Gary Hart (D-Colo.) and President Ronald Reagan were both perceived as supporting high-technology industries by DPers randomly polled at a recent conference here. Only a small percentage said Walter Mondale supports high tech, and none thought Jesse Jackson does.

Most respondents indicated they back either Hart or Reagan in the upcoming presidential election; Jackson and Mondale received little support for president. The poll data, however, does not provide a basis for concluding that the candidates' relative support for high technology or the respondents' party affiliation or some other factor is the major basis for the respondents' backing of a particular candidate.

The poll, conducted by Women in Information Processing (WIP) at last month's Federal Office Systems Expo, also found that unemployment, inflation and the federal deficit top the list of national issues worrying the approximately 300 polled, whose opinions were tabulated from a larger sampling of the 27,000 conference attendees.

WIP looked for respondents who were vendors or users and work mainly with micros, minis or mainframes and broke down their answers to questions concerning, among other things, gender, age, party affiliation, salary, candidate preference and ranking of national issue concerns.

"Attitudes varied little depending upon salary, party affiliation, age, sex or whether the attendee was a user or vendor," WIP found. All respondents said unemployment, inflation, the national deficit, nuclear war, crime and foreign policy are of the greatest concern.

Respondents, of whom 60% were female and 40% were male, with an average salary of $39,000, also said (by 93%) that they strongly favored a woman running for vice-president.

Janice Miller, WIP international president, said the organization will compare the poll results with opinion data from other industries and larger, less homogeneous groups "to see how different our industry is from the rest of the world."

In general, she said, the poll data confirms her impression that there is much more agreement on basic issues within the data processing industry than within other economic sectors. "I find it over and over again," she said. "We're just a different breed. Within this industry people are just different. . . . We're more futuristic; we're more excited about changes and challenges. It's a mindset."

WIP did find differences when the poll results were tabulated by mainframe, mini and micro users and vendors. Mini users and vendors, for example, ranked unemployment fifth among their concerns, just behind equal rights, unlike mainframe and micro categories, which listed unemployment first. In fact, money issues seemed rather low on the list of concerns for mini users and vendors, and that was only one of several differences among the opinions expressed in that category.

While offering no theory on this difference, Miller said, "I was really surprised. Their [mini users/vendors] heads are so buried in the sand. They feel so secure in such a changing industry." Recent market research indicates the minicomputer industry faces a growing challenge from microcomputers and has the most to worry about in terms of unemployment, according to WIP.

The three categories provided the following information on party affiliation. The mainframe category was 63% Democrat, 22% Republican and 14% independent; the mini category was 42% Democrat, 33% Republican and 25% independent; the micro category was 52% Democrat, 30% Republican and 18% independent.

Support for the presidential candidates was broken down as follows: females — 35% for Hart, 9% for Jackson, 15% for Mondale and 41% for Reagan; males — 51% for Hart, 2% for Jackson, 9% for Mondale and 38% for Reagan; mainframe users/vendors — 45% for Hart, 0% for Jackson, 27% for Mondale and 27% for Reagan; mini users/vendors — 56% for Hart, 0% for Jackson, 0% for Mondale and 44% for Reagan; micro users/vendors — 40% for Hart, 4% for Jackson, 19% for Mondale and 37% for Reagan.

When asked which candidate supports the high-tech industry, the mainframe category responded as follows: 48% for Hart, 0% for Jackson, 16% for Mondale and 36% for Reagan. The mini category responded 34% for Hart, 0% for Jackson, 4% for Mondale and 63% for Reagan. The last group, micros, were 32% for Hart, 0% for Jackson, 21% for Mondale and 47% for Reagan.

Finally, respondents were asked to rank in order of importance 15 qualities most desirable in a president. WIP said females and males agreed that honest and strong leadership are No. 1 and No. 2 in importance. The respondents also thought presidents should be both well-educated and fair-minded.

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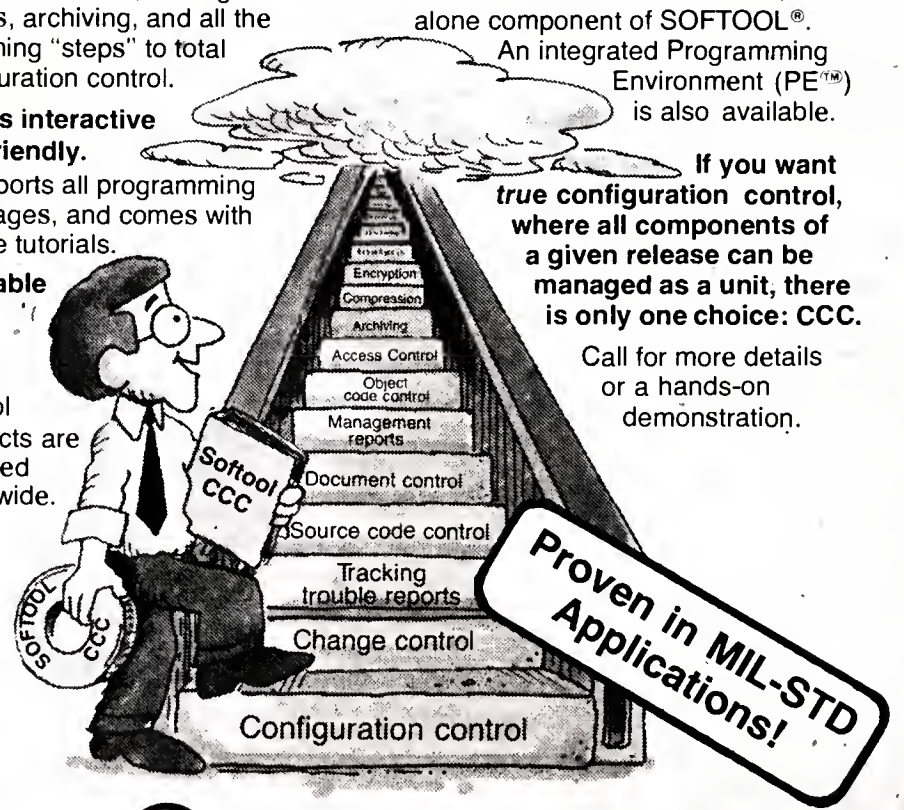

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20 Finance/Insurance/Real Estate
30 Medicine/Law/Education
40 Wholesale/Retail Trade
50 Business Service (except DP)
60 Government–State/Federal/Local
65 Public Utility/Communication Systems/ Transportation
70 Mining/Construction/Petroleum/Refining
75 Other User_____
Vendors
80 Manufacturer of Computers, Computer-related Systems or Peripherals
85 Computer Service Bureau/Software/Planning/ Consulting
90 Computer/Peripheral Dealer/Distributor/Retailer
95 Other Vendor_____

2. OCCUPATION/FUNCTION (Circle One)
11 President/Owner/Partner/General Manager
12 VP/Assistant VP
13 Treasurer/Controller/Financial Officer
21 Director/Manager/Supervisor DP/MIS Services
22 Director/Manager of Operations/Planning/ Administrative Services
23 Systems Manager/Systems Analyst
31 Manager/Supervisor Programming
32 Programmer/Methods Analyst
35 OA/WP Director/Manager/Supervisor
38 Data Comm Network/Systems Mgmt
41 Engr/Scientific/R&D/Tech Mgmt
51 Mfg Sales Reps/Sales/Marketing Mgmt
60 Consulting Mgmt
70 Medical/Legal/Accounting Mgmt
80 Educator/Journalist/Librarian/Student
90 Other_____

3. COMPUTER INVOLVEMENT (Circle all that apply)
Types of equipment with which you are personally involved either as user, vendor or consultant
A. Mainframes/Superminis
B. Minicomputers/Small Business Computers
C. Microcomputers/Desktops
D. Communications Systems
E. Office Automation Systems

CW-138

NEWS

Cafe mixes video, micro; offers 'menu-driven' service

By John Gallant
CW Staff

LAWRENCE, N.Y. — The claim is made so often that it has become something of a high-technology cliche — "the software is menu-driven." But one restaurant owner here has turned that phrase on its head. For the patrons of the Planet Earth Video Cafe, the menu is software-driven.

Set stylishly into the wall above each of the cafe's 30 tables is a 13-in. Panasonic Co. color television monitor connected to a bank of Panasonic commercial videocassette players. Customers seated at the tables or the bar, where additional monitors are located, can view any of the Planet Earth's three video channels simply by pushing one of the buttons beneath the monitor.

The cafe's "miscellaneous potpourri" channel offers a silent mix of movie clips, sports highlights and fashion show outtakes. A second channel highlights the music videos that are pounded out on the Planet Earth's sound system and simultaneously broadcast on the cafe's 8- by 10-ft television screen, according to manager William Chu.

But it is the cafe's Channel 1 — the computer-driven channel — that Chu said makes the Planet Earth different from any other restaurant in the nation. With a tap of the finger, customers can call up the cafe's ever-changing menu, which resides on a floppy disk on the Planet Earth's Commodore Business Machines, Inc. Model 64 microcomputer.

The Commodore micro is connected to one of the Panasonic videocassette decks, which transmits the disk information to the monitors. The menu actually consists of three different screens, each of which is formatted in different colors and remains on the monitor for 30 seconds to one minute in a continuously rotating cycle of culinary data.

The first screen outlines the Planet Earth's food selections, including the chef's specials, which are changed on disk from day to day. A second screen presents the cafe's wine list, and the third is a sort of electronic bulletin board that highlights upcoming events, which are also updated on disk each day. After viewing the menu, patrons place their orders with a waiter or waitress who, if necessary, can also instruct customers in the operation of the computerized system.

Chu said the electronic menu system was the brainchild of owner Ronald Pallaci, who also owns a chain of Wine Gallery restaurants located across New York state. "The Planet Earth used to be a Wine Gallery restaurant, but for some reason it wasn't doing as well as the others, which do a fantastic business," Chu explained. "He [Pallaci] was looking for a different theme, one that combined video and computer technology. The idea seems to have really caught on since we made the changeover six months ago. We have increased our business between 50% and 75% in that time."

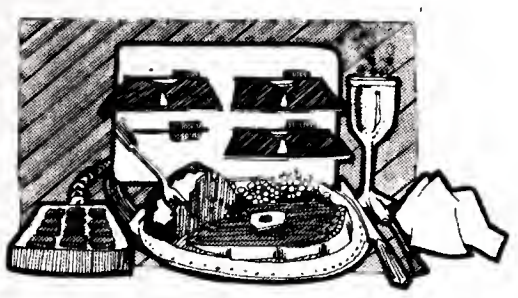


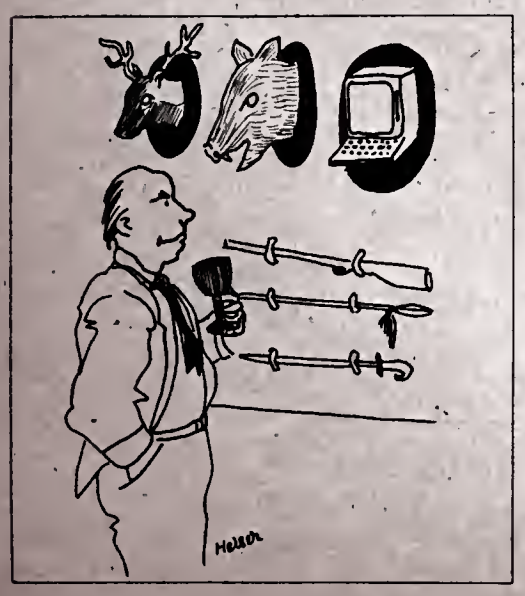
Illustration by K. VanValkinburgh

Chu estimated that the computerized menu system, including the monitors, micro and videocassette decks, cost between $15,000 and $20,000 and required extensive remodeling — and rewiring — to install. But by allowing management to add or delete items instantly and revise pricing, Chu said, the system ends the problem of printing up new menus periodically, which can cost as much as $2,000. The Planet Earth staff also uses the Commodore micro to maintain inventory data and the cafe's mailing list.

"Initially we had the reaction that the setup was less than classy for a restaurant," Chu said, "but that was before people actually saw it. It's so professionally done that it's turned everyone around.

"Customers love it. The system grabs their attention, and it entertains them.

"Also, as soon as they sit down, they have a menu right off the bat, and nobody feels neglected if we're busy and can't get to them right away. It gives us that extra minute to prepare and serve them better."



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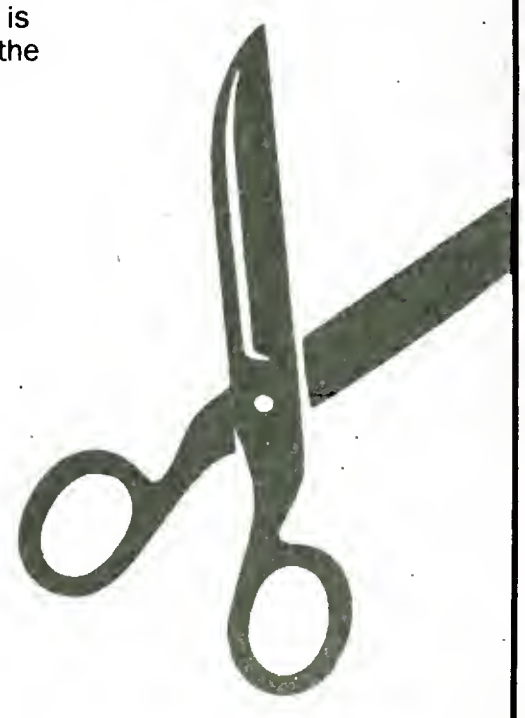

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NEWS

Cunard Line christens its floating computer center

NEW YORK — Nestled on the Boat Level of the *Queen Elizabeth 2*, with a view that overlooks the deck of the massive ocean liner, there is a room no passenger can book — for it is always occupied.

The room's occupants are always aboard, whether the *QE2* is enroute to the far corners of the globe on an epic 80-day journey or simply meandering about the Atlantic Ocean on a three-day "cruise to nowhere." Amidst the nightlife, the revelry and the romance, the residents of this chamber sit silently.

These mysterious passengers are actually six IBM Personal Computers placed on-board the *QE2* as part of what Cunard Line Ltd. calls the first floating computer center. Manned by an instructor and equipped with a variety of software, the computer center is designed to give travelers an opportunity to catch up on their work or improve their computer literacy.

"We try to include on our cruises the things that capture the interest and imagination of the American public. Computers are something Americans want to use and something they want to learn about. We think a cruise is the perfect venue for professional people who haven't had the time at home or at work to learn to use a computer. There are no distractions, and the atmosphere makes it less intimidating," said Alice Marshall, public relations manager for Cunard Line.

Use of the equipment and software is free of charge to passengers who reserve time in the computer center. Shortly after the 14-year-old ocean liner leaves its home port here, subscribing passengers are given an introductory lesson by the center's instructor, who is then available to provide one-on-one guidance. Marshall said every cruise offers a different instructor, each of whom is an employee of IBM assigned to what can hardly be labeled hazardous duty.

In addition to an array of word processing, spreadsheet and other business and entertainment software, the computer center also provides self-help packages that let passengers "learn by doing." Since the computers were installed aboard the 1,800-passenger liner in January, Marshall said, the center has been booked solid. If its popularity continues, the *QE2's* computer center will be expanded, and similar facilities may be offered aboard the Cunard Line's four other ships.

Wang Institute announces summer courses for computer scientists

TYNGSBORO, Mass. — The Wang Institute of Graduate Studies will offer a series of short, noncredit courses for computer scientists at the institute's campus here from May through August.

The first course in the series, "Logic Programming Using Prolog," will be taught May 14-18 by Dr. Keith L. Clark, senior lecturer at Imperial College in London. The course will provide instruction in logic programming using Prolog and the use of Prolog for deductive data bases, general list processing and natural language parsing.

A course scheduled for June 4-8 on "Operating Systems" will provide instruction in small and medium-size operating systems using examples and exercises drawn from production systems and subsystems.

A course in "Software Engineering Principles" will be offered June 18-22 and will cover the use of specifications in the design of software and the design and synchronization of cooperating sequential processes, among other topics.

Courses in "Implementation of Relational Systems," "Introduction to Interactive Computer Graphics," "Resource Modeling and Cost Estimation" and a "Software Project Management Workshop," among others, will be offered later this summer.

All courses in the series are priced at $900, except for the "Software Project Management Workshop," which is $1,200.

Further details regarding the Wang Summer Institute are available from the Coordinator of Special Programs, Wang Institute of Graduate Studies, Tyng Road, Tyngsboro, Mass. 01879.

AMS '84 set for June in Chicago

CHICAGO — The importance of the computer in automated production will be the highlighted theme at the Advanced Manufacturing Systems Exposition and Conference (AMS '84), which will be held June 12-14 at McCormick Place here.

AMS '84 is intended for executives of manufacturing companies who are interested in information systems and automated production systems.

The keynote address, titled "The 'Knowledge Worker' — Is Management Fumbling the Ball?" will be given by Jack C. McVickers, vice-president of operations for Martin Marietta Orlando Aerospace, Orlando, Fla.

The conference will include 63 sessions in 10 areas of interest to manufacturing executives. Four full-day, intensive courses on robotics and personal computers also will be offered.

Registration fees for the AMS sessions will be $285 for those attending all three days, $150 for one day and $85 for a half day. The robotics courses will cost an additional $230 each, and the personal computer classes will cost $285 each.

A software exposition and conference for information managers called Info/Software will be held at the same time and location as AMS '84. The event will require a separate registration fee.

AMS '84 and Info/Software are produced by Clapp & Poliak.

More information is available from the Show Manager, AMS '84, 999 Summer St., Stamford, Conn. 06905.

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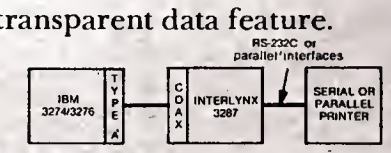

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Programmer's tool kit seen needed for breakthroughs

By Robert Batt
CW West Coast Bureau

LOS ANGELES — Programmers need to be equipped with a comprehensive tool kit if the software logjam of the 1980s is to be broken, attendees at the recent Comdex/Winter '84 show here were told.

Fourth-generation languages on their own are insufficient to meet today's productivity needs, said Tom Love, a consultant at Micro Focus, Inc., a Palo Alto, Calif.-based manufacturer of programmer productivity tools. Speaking at a session on "Quick-Fix Program Generators," Love said, "It is clear that programmers are going to be around for some time to come. What we need to assist these professionals is a number of integrated programmer productivity tools.

"In fact, we need a programmer's tool kit," Love told his audience. He envisions the kit including program generators, editors, optimizing tools (native code generators, for example) and debugging tools, as well as more design and maintenance tools.

"Given that typically 60% of a programmer's time is being spent on maintenance, it is clearly a sadly neglected area as far as productivity tools are concerned. There is a need for either easily read code or products that self-document," Love said.

Love, who has worked for several years as a consultant in applications and systems development areas, said that while program generators are not the only way to break the backlog of applications projects, they are a useful aid.

In an interview following his speech, Love criticized current program generators for lacking the flexibility that users need.

"End users of applications rarely know what they want, and this often leads to extensive rewriting of programs. The problem with the program generators of today is that they do not exactly fit the needs of end users and value-added resellers," he claimed.

Not specific to users

Too many program generators, Love complained, are not specific to users or applications. They are spread across too wide a spectrum. "There is a need to have program generators for professionals and a need to have tools for the novice. Program generators should be developed with the end user in mind. . . . Vendors must be familiar with end-user requirements," he asserted.

Love contended that program generators are not really suitable for specific large-scale applications. Rather, they are good at quick-fix, vertical programs for users who do not know exactly what they want, but can discover their needs by generating programs.

For this reason, he added, program generators that use source code of a well-known language, such as Cobol, are advantageous. In his Comdex presentation, Love enumerated a number of advantages reportedly possessed by program generators written in Cobol:

- They make standard data base acquisition programs rapidly.
- They generate error-free code.
- They produce end-user documentation.
- They create standard Cobol source code.

Also speaking at the session was Jeb Long, staff technologist at Ashton-Tate, the manufacturer of the Dbase II software package, who called for more friendly program generators that incorporate extra power and intelligence and are better documented.

"There is a whole new segment of the market opening up which is aimed at the casual user. We, therefore, have to find a better way of making systems more friendly," Long said.

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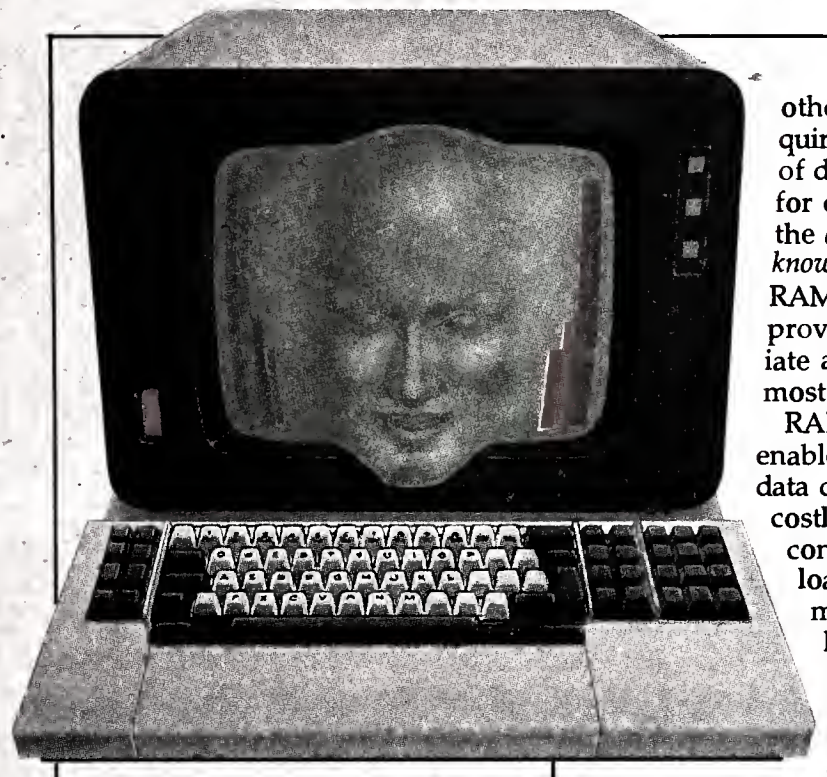

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Blind programmer updating Cobol programs

McKenzie and Sheba

SAN FRANCISCO — A blind programmer/analyst at Levi Strauss and Co. here believes people without sight can do just as well as anyone in data processing, provided they have the tools to compensate. In his case, those tools are a talking terminal, a leader dog and an interactive testing and debugging program.

Using the terminal and the interactive program, David McKenzie does program maintenance for a group of older Cobol programs that control shipping and receiving for the company's truck fleet. Those programs are constantly being updated, and McKenzie uses the program — Application Development Systems, Inc.'s Xpediter — to ensure that program changes work and have not suppressed other functions of the system.

McKenzie admitted he is probably slower than most other programmers, but added he is likely to be more thorough. Several special features of Xpediter, he said, give him the ability to move slowly through a program as he traces its logic or examines its source code. Using Xpediter, he can set breakpoints anywhere in a program, and the program will halt and provide specific details, such as source code and data, when it reaches them.

McKenzie also noted that he uses another Xpediter feature, a pause control, on just about all of the 12 or 13 programs he tests weekly. He also uses Xpediter's display feature to display source code as it is being written.

That display, of course, is verbal, not visual, but McKenzie's talking IBM 3278 terminal uses a voice synthesizer to read the screen's display in either a line-by-line or full-page mode. Though the programs with which he works are older than most, the majority of McKenzie's work is now done on-line, using the terminal and Xpediter running on an IBM 3081 mainframe under MVS/TSO.

For testing and maintaining programs, McKenzie said he favors Xpediter over IBM's Testcob, another testing program in use by the firm, for its greater power and ease of use.

Despite his handicap, McKenzie is no slouch as a programmer. He knows approximately 12 programming languages — Cobol, assembler and Fortran among them — and has gained both associate's and bachelor's degrees. He eventually plans to gain an MBA as well and ultimately become a data processing administrator.

McKenzie credits the success he has had as a programmer to his refusal to "be limited by the way sighted people do it." He said he tells other blind people entering data processing that "it's not an easy field to master, but for everything that a sighted person does that a blind person can't do, there's a way [for the blind] to do it."

Another of McKenzie's "ways" of overcoming blindness involves his dog, Sheba, a golden retriever that attended classes with him while he studied for his associate's degree at DeAnza College in Cupertino, Calif. Sheba eventually accompanied him up the aisle at graduation wearing her own cap and gown, compliments of the school's administration.

McKenzie also credits Levi Strauss with creating a supportive environment for blind programmers. The company supplied McKenzie with the talking terminal but, he noted, offers the handicapped no demeaning "special treatment." Two blind applications programmers work in another Levi Strauss department, he noted.

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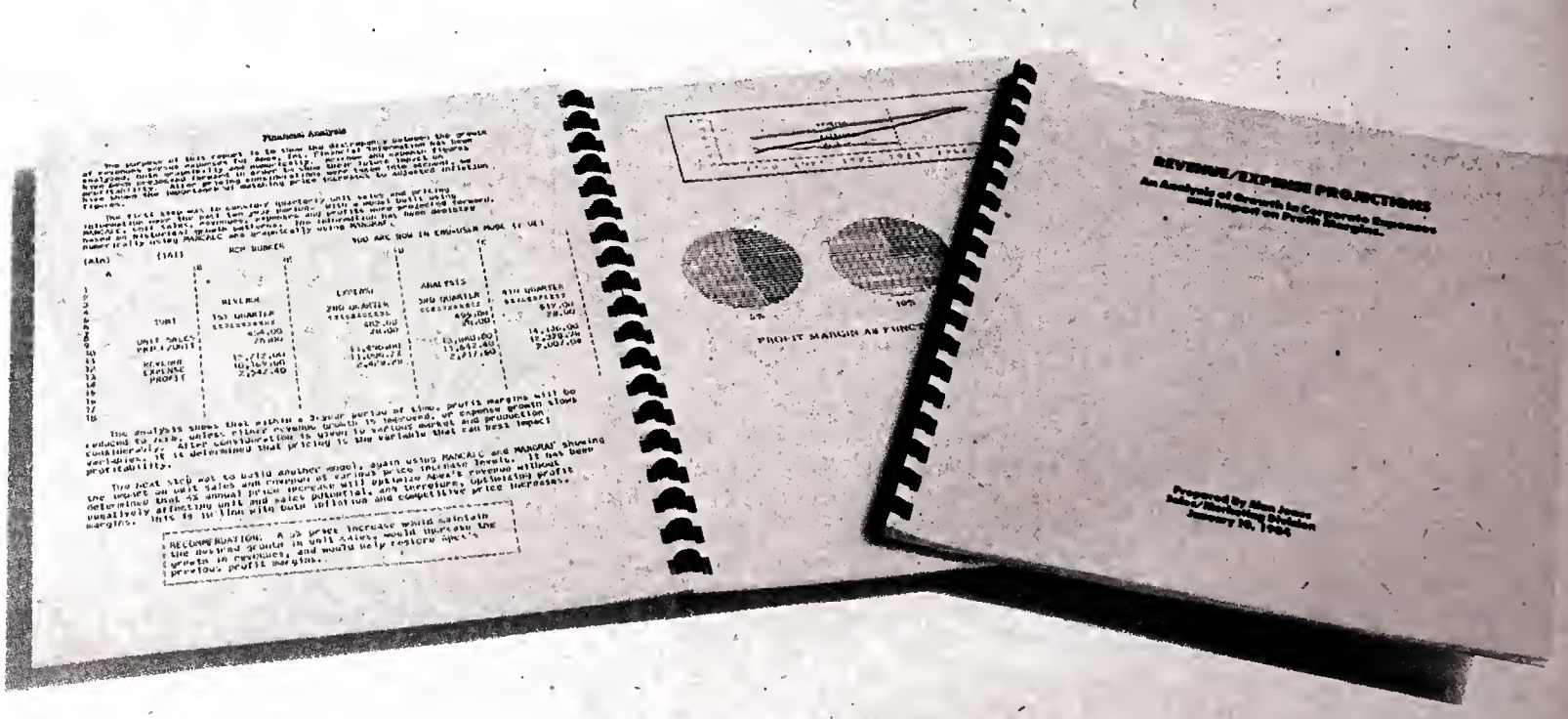

Data dictionary steers Amtrak onto right track

WASHINGTON, D.C. — A data dictionary has brought organization and reduced effort to the production of program documentation in National Rail Passenger Corp.'s Computer Services Department, according to the department's project manager for data administration.

The data dictionary also provides the firm — better known as Amtrak — with a central point for recording changes in programs and the steps in new routines, project manager Barbara Rohland said. When documentation had been done manually, employee turnover had meant that "experts for undocumented systems were walking out the door and taking their knowledge with them," Rohland said.

The data dictionary, she explained, shows the relationships between programs, where data is stored and the running instructions involved. It displays its documentation on users' screens — Rohland said printed documentation would be too voluminous — and operates on the department's IBM IMS data base management system, which runs on three IBM 3033 mainframes.

Since its introduction in the rail passenger agency seven years ago, the University Computing Co. UCC-10 Data Dictionary/Manager has been used to document the programming for several financial and personnel applications programs, including a labor data collection system. That system receives input on Amtrak employee work hours, absenteeism and overtime from over 100 data entry terminals nationwide.

UCC-10 is also aiding the department's quality assurance program where, according to Rohland, it provides a central place for all the bits and pieces of documentation about a system and is proving helpful for programming impact analysis. "If something is modified," she explained, "we can use the dictionary to determine everything affected by that change. For example, if a data definition or program is to be modified, we can use UCC-10 to determine what users or applications will be affected and must be considered if the change occurs."

Saves department time

The data dictionary also saves the department time, Rohland said. Its "generate" features create Cobol I/O areas and IMS control blocks, and its "convert" feature automatically structures existing files and data bases by indicating what file or data base must be built, where it is to be taken from and how it is to be structured, she said.

In the future, Rohland said, the documentation provided by the data dictionary will prove useful as the Computer Services Department incorporates Information Builders, Inc.'s Focus, a fourth-generation language that will ease DP for Amtrak's non-DP personnel. Focus will be used by Amtrak departments such as marketing, payroll and finance and will run on IBM 4300 processors and several personal computers, Rohland said.

The UCC-10 data dictionary does not interface with the Focus language, she noted, but will provide Focus users with the locations of the data they are seeking.

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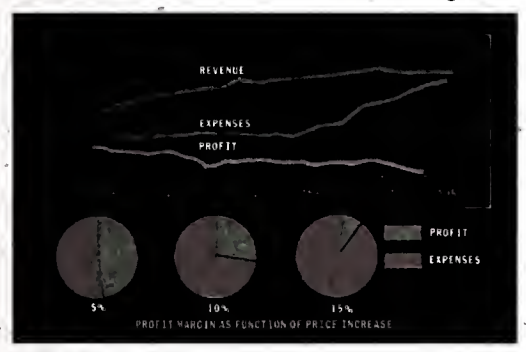

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Computerworld's June Special Report will take a look at graphics systems on mainframes and on micros. It will focus on graphics from business graphics to computer-aided design, from stand-alone microcomputers to integrated systems.

CW welcomes contributions to this Special Report from its readers. The contributions may take one of two forms: a tutorial article discussing an issue or trend; or a story outlining a particular user's experience with a graphics system or software package.

Articles must be typed, double-spaced and range in length from four to six pages. Artwork, such as charts, graphs and photographs, is welcomed.

The deadline for submissions to the Special Report is April 25. If you have a picture of computer graphics that you would like to draw and a picture's worth or so of words, send them or any questions to Donovan White, Special Reports Editor, *Computerworld*, 375 Cochituate Road, Box 880, Framingham, Mass. 01701.

WP to aid Chinese-English effort

By David Olmos
CW Staff

AMHERST, Mass. — Computer technology will play a significant role in a cooperative effort by the University of Massachusetts at Amherst (UMass) and China's Peking Institute of Foreign Languages to develop a comprehensive Chinese-English dictionary.

A Chinese-character word processing system donated for the project by the founder of Wang Laboratories, Inc., Dr. An Wang, will be used for gathering and processing data, as well as for possible future revisions of the dictionary. Shou-Hsin Teng, chairman of the Asian studies department at UMass and project director for the dictionary, estimated the dictionary would require double the time and staff if done manually.

As evidence of the magnitude of the undertaking, Teng noted that even with the help of computers, the project is still expected to take five to six years to complete.

The stage for this joint effort between the U.S. and China was set back in October 1982, when Teng first learned that the Peking Institute planned to update a dictionary published in 1978. He suggested that UMass could aid in the project by supplying computer technology of a kind not yet available in China.

The word processing system will be especially useful in developing several cross-reference indexes that will be required to help English-speaking people find the Chinese words they need. At least five indexes will be needed, Teng said.

"Hopefully, after the first volume is published in five or six years, we will be continuously revising our data base," Teng said.

The Wang donations include two Model 5324-I workstations and a Model 9540-I dot-matrix printer that can produce Chinese ideographs. The Wang system, which will be housed at UMass, contains an 11,000-character memory of Chinese ideographs. The word processor uses an English standard keyboard and can be coded using a system in which three corners of a Chinese character are assigned a two-digit code. The resulting six-digit code is displayed on the monitor and then printed out.

The project is dependent on UMass obtaining a three-year grant of $500,000 from the National Endowment for the Humanities. If the grant falls through, Teng said that private funding may be sought.

UMass is contributing more than $220,000 to the project. The Chinese government will support a full-time staff of 20 people in Peking, who will be responsible for collecting raw data for the dictionary.

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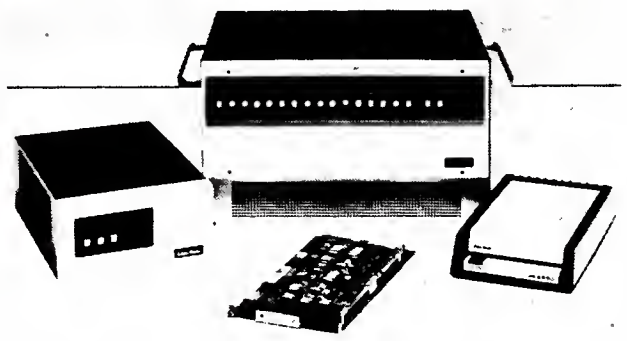

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HP 5321B-K21 *Digital clock.*

HP 5327B *Timer/Counter/DVM, preferably with Options H31, 004, and 011.*

HP 10542A *Remote programming interface cable.*

If you have any or all of this equipment which we might buy, please call:
R. A. Arens, (314) 925-5983.

Or write:
R. A. Arens, Dept. E411, Building 98,
McDonnell Douglas Astronautics Company, Box 516, St. Louis, MO 63166.

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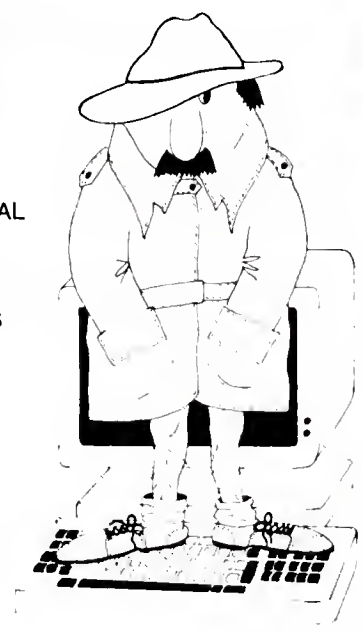

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NEWS

INTERNATIONAL REPORT
CW International News Network

AUSTRALIA

CAMPERDOWN — Computer Accounting Services Pty. Ltd. has placed an order for seven Digital Equipment Corp. VAX-11/750 superminis. One will be used to run a videotex service, and the rest will handle Infopro, the company's on-line information and accounting service.

BELGIUM

BRUSSELS — The European Economic Commission's European Strategic Program for Research and Development in Information Technology (Esprit) project will develop an experimental local-area network system. The European Local-Area Network (Elan) initially will be used by Esprit itself, facilitating communication between its various task forces. The research and development contract for Elan has been awarded to a consortium of four leading European information technology companies: Bull, ICL Co., Olivetti and Sted and Siemens AG. Evolving international standards for Open System Interconnection and local-area networks will be included in the project.

BRAZIL

RIO DE JANEIRO — During the second meeting of the Computer Software Companies group, Jose Maria Sobrinho, president of the Brazilian Association for Information Services Companies, argued for market reservation for the software sector — with certain limitations. He said that such a policy would establish a more equitable environment for competition between national companies and multinational software firms.

CHINA

HONG KONG — Swire Systems, the microcomputer supplies unit of the Swire Pacific Group, has appointed an Indonesian distributor, which has signed to buy $5 million worth of equipment over three years. Significantly, the Indonesians have ordered an equal mix of Victor Business Products, Inc. and Apricot computers. A Swire spokesman commented, "People we talk to are aware of Victor's status, but it hasn't affected sales in the region."

■

BEIJING — A plan to computerize city management here has been made by the Beijing Municipal People's Government. Ten large projects are scheduled for completion by the end of the year. The projects include 15 traffic control stations, eight business management systems in eight hotels and 50 enterprise management systems in large factories.

JAPAN

TOKYO — Nippon Electric Co. Ltd. has unveiled three 32-bit small business computers called System 150/78, 150/68 and 100/58, bringing the number of NEC's small business systems up to seven. Priced from $36,298 to $57,830, the 32-bit processors operate within the vendor's local-area network.

NEW ZEALAND

WELLINGTON — Databank Systems Ltd. has purchased nine Nonstop systems from Tandem Nonstop Ltd., the local subsidiary of Tandem Computer, Inc. The systems, valued at approximately $8 million, are destined for Databank's two regional headquarters and five remote locations in New Zealand. Databank reportedly plans to use the systems for electronic funds transfers (EFT), but no decision has been reached on what EFT software Databank will choose.

Siggraph plans July conference

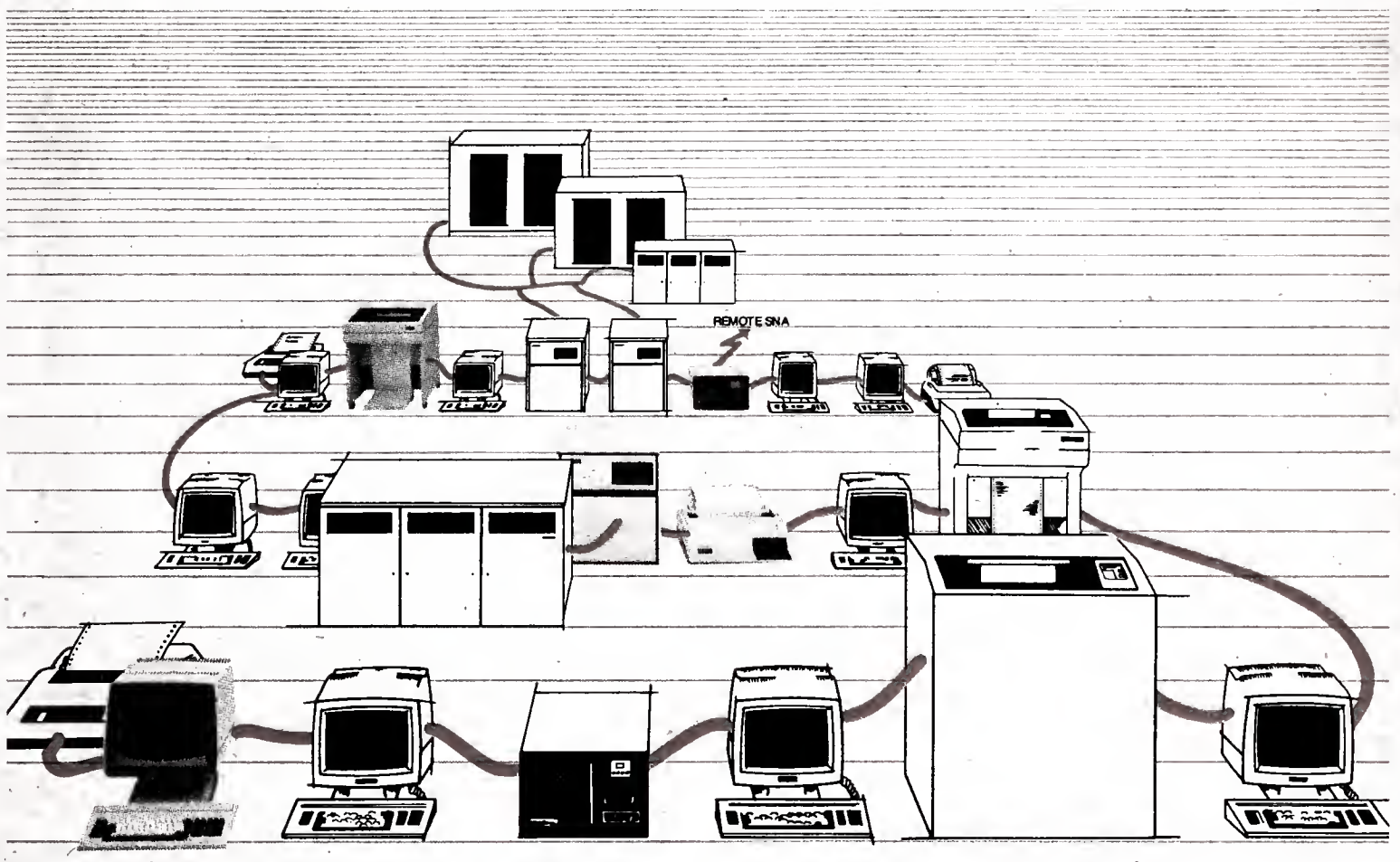
MINNEAPOLIS — The Association for Computing Machinery's (ACM) Special Interest Group on Computer Graphics (Siggraph) will hold its 11th Annual Conference on Computer Graphics and Interactive Techniques here July 23-27.

Siggraph '84 will feature sessions on computer graphics research findings, application advancements, technological breakthroughs and industry issues. Presentations are scheduled to focus on ray tracing techniques, modeling, hardware, algorithms, interactive systems, shading and texturing, algorithms for painting and matting and graphics standards. Also, 27 courses on various topics will be offered.

One-day course fees for registrations received before June 15 are $195 for ACM members and $235 for nonmembers ($280 for both after June 15). Two-day fees are $335 for members and $365 for nonmembers until June 15 ($410 after that date).

The technical programs are priced at $195 for members and $270 for nonmembers before June 15, and $335 for members and $365 for nonmembers afterwards.

More information is available from the ACM Siggraph '84 Conference Office, 111 Wacker Drive, Chicago, Ill. 60601.



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NEWS

CALL FOR PAPERS

INSTRUMENT SOCIETY OF AMERICA (ISA) CONFERENCE
Boston, May 14-16, 1985

ISA is looking for papers concerning sensors and transducers in process measurement and control; microprocessors for control and distributed control in computer technology; fiber-optics communications and lasers for measurement in electro-optics; metrology and calibration techniques and standards in test measurement; distributors, product training and digital training for sales engineers in marketing and sales; and date acquisition and telemetry, wind and solar power sources and satellite communications in marine sciences.

A short summary or abstract of the work should be sent by May 15 to Keith S. Herbst, 1803 Rose Valley Way, Ambler, Pa. 19002.

INTEGRATED ON-LINE LIBRARY SYSTEMS
Atlanta, Sept. 13-14

Papers are solicited that address aspects of integrated on-line library systems including selection and evaluation; installation of systems; administrative issues; aspects of multicampus, multibranch or multitype installations; interfacing; linking systems; local-area networks; integrated data bases; data base conversion; new and emerging systems and interacting subsystems; and other related topics.

The maximum length for papers is 2,500 words. Complete typewritten copies of manuscripts (including illustrative material) must be received no later than June 30.

Papers should be submitted to Genaway & Associates, Inc., 530 W. Regency Circle, P.O. Box 477, Canfield, Ohio 44406.

1985 OFFICE AUTOMATION CONFERENCE (OAC '85)
Atlanta, Feb. 4-6, 1985

Sponsored by the American Federation of Information Processing Societies, Inc., OAC '85 is currently looking for papers on the following tracks: organizational impacts; office workstations; ergonomics of the workplace; communications technologies and issues; productivity and requirements evaluation; and networking applications.

Proposals should outline the possible issues to be presented or discussed at OAC sessions, the names and relevant qualifications of proposed session participants, the selected track and whether the proposal should be evaluated as a track workshop.

Proposals should be two to four typed pages. Three copies of each proposal should be submitted by June 15.

OAC '85 is also sponsoring a paper competition. Papers submitted should represent an application of office automation where major impact has resulted. Five double-spaced copies of papers that do not exceed 12 pages must be submitted by June 15. All papers should be submitted to OAC '85 Program, Dr. Sidney E. Harris, Director, Research and Program Development, Decision Sciences Laboratory, Georgia State University, University Plaza, Atlanta, Ga. 30303.

CONFERENCE ON COMPUTER-AIDED TECHNOLOGIES (Compint '85)
Montreal, Sept. 9-12, 1985

Sponsored by the Institute of Electrical and Electronics Engineers (IEEE), Compint '85 is seeking papers on computer-aided design, manufacturing, industrial operations, decision making and office systems; computer-assisted education; computer communications; computer graphics; man-machine communications; and advanced software for industrial systems.

The deadline for papers is Oct. 1. Authors should send either a long paper of no more than 6,000 words or a short paper of no more than 2,000 words. Short papers should also include a 200- to 500-word abstract. All papers should be submitted to: Compint '85, P.O. Box 577, Desjardins Postal Station, Montreal, Que., Canada H5B 1B7.

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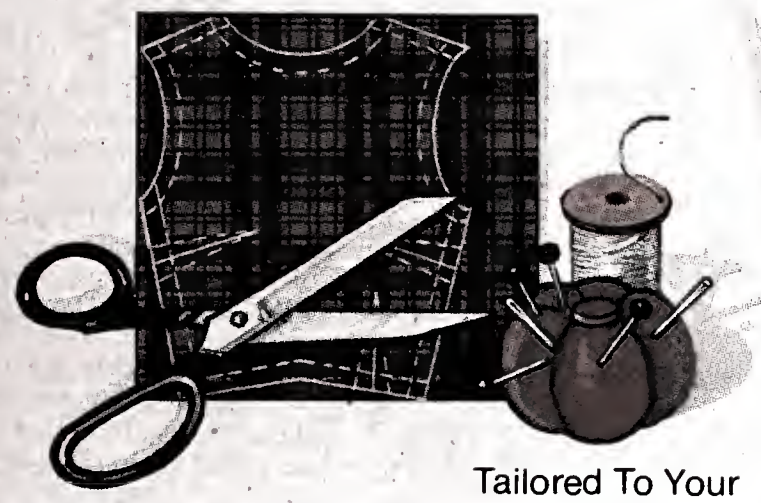

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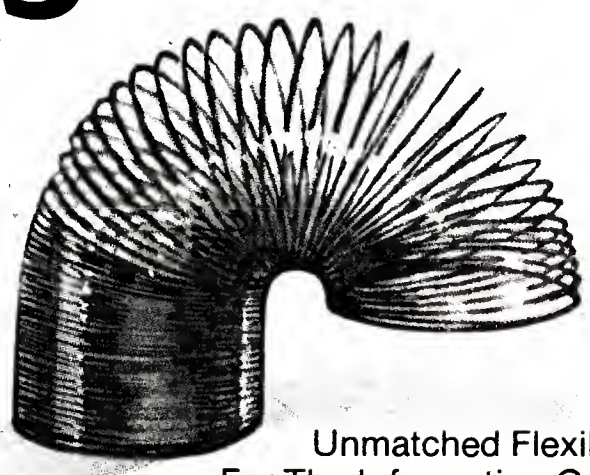

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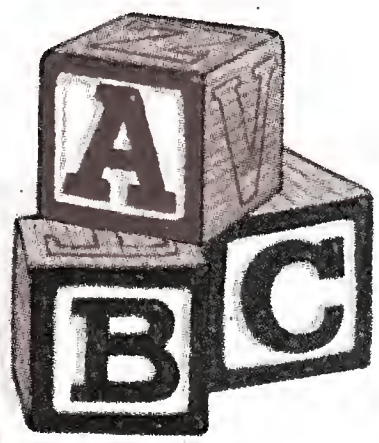

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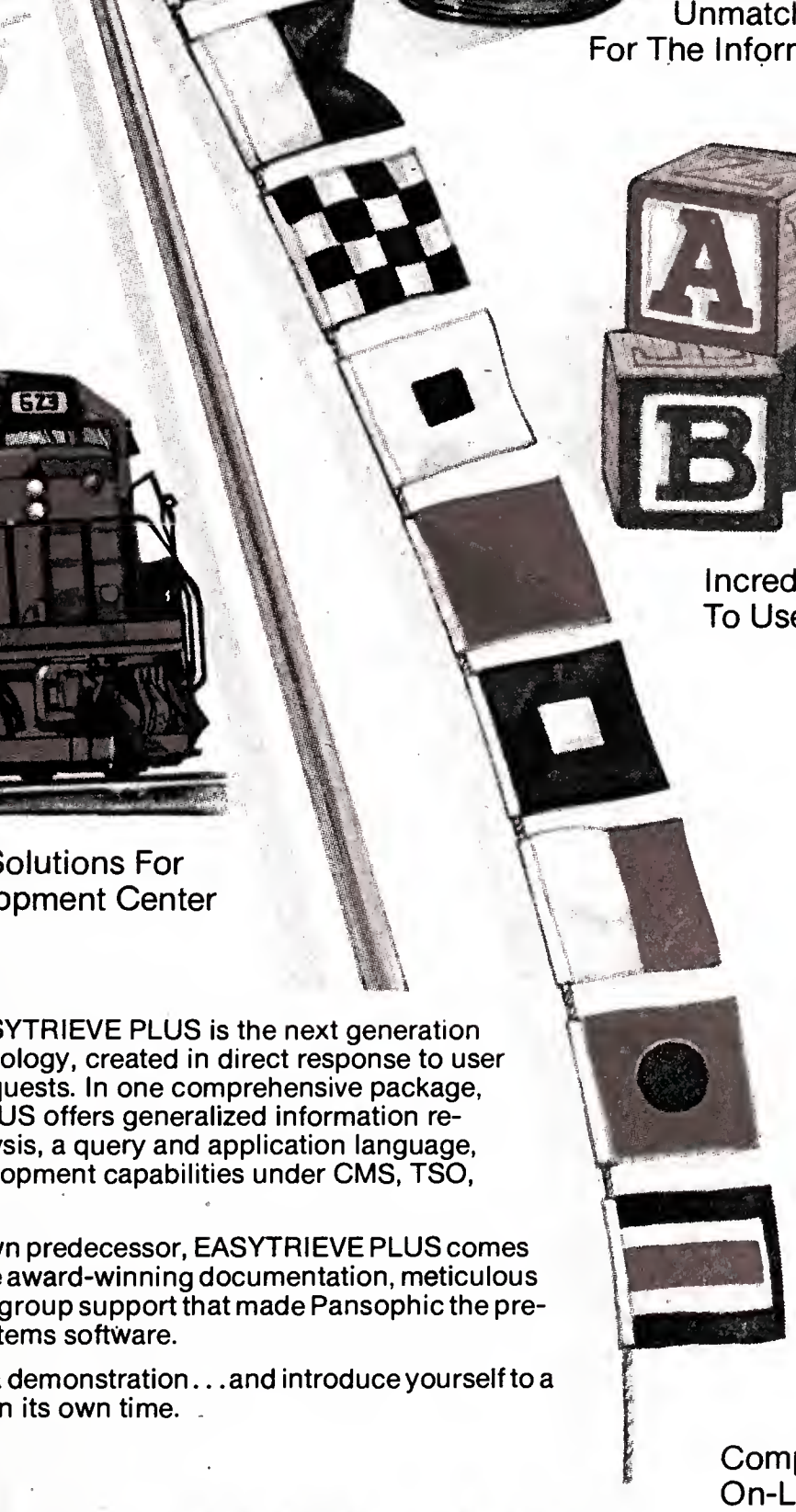

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CALENDAR

WEEK OF MAY 13

MAY 13-17, PROVIDENCE, R.I. — **The Spring 1984 Conference of Honeywell Small/Medium Systems Users.** Contact: North American Honeywell Users Association, P.O. Box 2037, Willingboro, N.J. 08046.

MAY 13-17, ANAHEIM, CALIF. — **Computer Graphics 1984.** Contact: National Computer Graphics Association, 8401 Arlington Blvd., Fairfax, Va. 22031.

MAY 14-15, CHICAGO — **Local-Area Networks.** Contact: Techtran, 72 Cummings Point Road, Stamford, Conn. 06940.

MAY 14-15, CHARLOTTE, N.C. — **Vsam OS and DOS Performance and Tuning.** Contact: Betty Bruce, Goal Systems International, Inc., 5455 N. High St., Columbus, Ohio 43214.

MAY 14-16, SAN FRANCISCO — **Data Communications: Effective Network Design.** Contact: Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

MAY 14-16, CHICAGO — **Telecommunications Management: Equipment Planning, Selection and Use.** Contact: Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

MAY 14-16, SAN FRANCISCO — **Strategic Planning for Office Automation.** Contact: Technology Transfer Institute, 741 10th St., Santa Monica, Calif. 90402.

MAY 14-16, SAN FRANCISCO — **Computer Operations: Effective Production Scheduling and Control.** Contact: Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

MAY 14-16, TEANECK, N.J. — **Project Management.** Contact: QED Information Sciences, Inc., QED Plaza, P.O. Box 181, Wellesley, Mass. 02181. Also being held May 14-16 in Boston.

MAY 14-16, SAN FRANCISCO — **Strategic Planning for Office Automation.** Contact: Technology Transfer Institute, 741 10th St., Santa Monica, Calif. 90402.

MAY 14-16, NEW YORK — **Computer Literacy for Accounting and Financial Managers.** Contact: American Management Associations, 135 W. 50th St., New York, N.Y. 10020.

MAY 14-18, HOUSTON — **Data Base Development Workshop.** Contact: Elise Rabalais, Learmonth & Burchett Management Systems, Inc., Suite 405, 2800 N. Loop W., Houston, Texas 77092.

MAY 14-18, WASHINGTON, D.C. — **Managing the Audit of Computer-Based Bank Systems.** Contact: Darlene Floading, Bank Administration Institute, 60 Gould Center, Rolling Meadows, Ill. 60008.

MAY 14-18, NEW YORK — **Structured Systems Analysis Workshop.** Contact: Elise Rabalais, Learmonth & Burchett Management Systems, Inc., Suite 405, 2800 N. Loop W., Houston, Texas 77092.

MAY 14-18, CHICAGO — **Advanced Structured Analysis.** Contact: Yourdon, Inc., 1133 Ave. of the Americas, New York, N.Y. 10036.

MAY 14-18, ENGLEWOOD CLIFFS, N.J. — **Work Load Analysis and Forecasting.** Contact: Institute for Software Engineering, 510 Oakmead Pkwy., Sunnyvale, Calif. 94086.

MAY 14-18, WASHINGTON, D.C. — **Information Modeling Workshop.** Contact: Yourdon, Inc., 1133 Ave. of the Americas, New York, N.Y. 10036.

MAY 14-18, NEW YORK — **IMS/DC.** Contact: Sysed, One Park Ave., New York, N.Y. 10016.

MAY 14-19, HOUSTON — **Expotech International.** Contact: Expotech International, 8th Floor, 2033 M St. N.W., Washington, D.C. 20036.

MAY 15-16, ATLANTA — **OS Dumps and Debugging.** Contact: Advanced Technology Systems, Inc., P.O. Box 6800, Norcross, Ga. 30091.

MAY 15-16, CHICAGO — **Factory Systems Summit Conference.** Contact: The Yankee Group, 89 Broad St., Boston, Mass. 02110.

MAY 15-17, BOSTON — **Electro '84 High-Technology Electronics Exhibition and Convention.** Contact: Electronic Conventions, Inc., 8110 Airport Blvd., Los Angeles, Calif. 90045.

MAY 15-17, ARLINGTON, VA. — **SAS Basics Course.** Contact: SAS Institute, Inc., P.O. Box 8000, Cary, N.C. 27511.

MAY 15-18, BIRMINGHAM, ENGLAND — **Communications 1984.** Contact: Kallman Associates, 5 Maple Court, Ridgewood, N.J. 07450.

MAY 15-18, KANSAS CITY, MO. — **Structured Systems Design.** Contact: Georganna Carson, Ken Orr and Associates, Inc., 1725 Gage Blvd., Topeka, Kan. 66604.

MAY 15-18, ST. LOUIS — **CICS Logic and Debugging.** Contact: Center for the Study of Data Processing, Campus Box 1141, Washington University, St. Louis, Mo. 63130.

MAY 16-17, NEW YORK — **IBM Directions in Communications, Office Systems and Personal Computers.** Contact: Marilyn Chasteen, The DMW Group, Inc., 2020 Hogback Road, Ann Arbor, Mich. 48104.

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The result has been Super-MSI V7.3. This interim release supports sharing of these VSAM QNAMEs between DFP and non-DFP systems through the MSI option DFPCMPAT. Rental of DFP/370 for non-XA 308X and 43XX machines as well as all 303X machines is no longer required to achieve compatibility!

Regardless of your XA migration schedule, this feature of Super-MSI V7.3 will be a useful and cost-saving aid. But, this is not the only enhancement we have to announce. In addition, V7.3 includes our first in a series of enhancements that will make SIS more flexible and easier to use . . .

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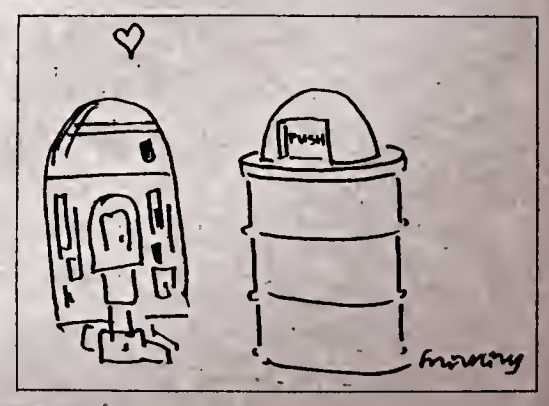

NEWS

MAY 16-17, GREENBELT, MD. — **Relational Data Base Systems.** Contact: Center for Management Development, College of Business and Management, University of Maryland, College Park, Md. 20742.

MAY 16-17, COLLEGE PARK, MD. — **Programming in Basic.** Contact: Center for Management Development, College of Business and Management, University of Maryland, College Park, Md. 20742.

MAY 17, ATLANTA — **Dbase II.** Contact: Software Institute of America, Inc., 8 Windsor St., Andover, Mass. 01810.

MAY 17-18, NATICK, MASS. — **Systems Design.** Contact: Kathy Shaw, Office of Continuing Education, Higgins House, Worcester Polytechnic Institute, Worcester, Mass. 01609.

MAY 17-18, ORLANDO, FLA. — **IDMS System Generation and Tuning.** Contact: Harris Education Center, 1025 W. Nasa Blvd., Melbourne, Fla. 32919.

MAY 17-18, ATLANTA — **Computer Networks: Protocols, Standards and Compatibility.** Contact: Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

MAY 17-18, COSTA MESA, CALIF. — **System Productivity Facility Dialog.** Contact: Software Intelligence of America, P.O. Box 1390, Spring Valley, Calif. 92077.

MAY 19, SEATTLE — **Hands-On Unix.** Contact: Specialized Systems Consultants, P.O. Box 7, Northgate Station, Seattle, Wash. 98125.

WEEK OF MAY 20

MAY 20-22, ANDOVER, MASS. — **Advances in Office Automation.** Contact: Institute for Graphic Communication, 375 Commonwealth Ave., Boston, Mass. 02115.

MAY 20-23, FORT LAUDERDALE, FLA. — **Harris Users Exchange 1984 Symposium and Annual Meeting.** Contact: Gary Chapman, Harris Corp., Computer Systems Division, 2102 W. Cypress Creek Road, Fort Lauderdale, Fla. 33309.

MAY 21-22, NEW YORK — **Data Communications II.** Contact: Business Communications Review, 950 York Road, Hinsdale, Ill. 60521.

MAY 21-22, SAN FRANCISCO — **Datacom Network Design and Planning.** Contact: Probe Research, Inc., P.O. Box 590, Morristown, N.J. 07960.

MAY 21-22, DENVER — **ADP Project Management in Government.** Contact: U.S. Professional Development Institute, Department AB, 1620 Elton Road, Silver Spring, Md. 20903.

MAY 21-22, SAN FRANCISCO — **Electronic Financial Services.** Contact: Law & Business, Inc., 757 Third Ave., New York, N.Y. 10017.

MAY 21-22, NEW YORK — **Evaluating Decision Support Software.** Contact: Donna A. Kacin, Research & Planning, Inc., 215 First St., Cambridge, Mass. 02142.

MAY 21-23, SAN FRANCISCO — **Microcomputer Data Base Management Systems.** Contact: Software Institute of America, Inc., 8 Windsor St., Andover, Mass. 01810.

MAY 21-23, CARY, N.C. — **SAS Principles of Regression Analysis Course.** Contact: SAS Institute, Inc., P.O. Box 8000, Cary, N.C. 27511.

MAY 21-24, PHILADELPHIA — **Structured Programming.** Contact: QED Information Sciences, Inc., QED Plaza, P.O. Box 181, Wellesley, Mass. 02181.

MAY 21-24, TEL AVIV — **Isratech 1984.** Contact: Peter Muhlrad, Israel Trade Center, 350 Fifth Ave., New York, N.Y. 10118.

MAY 21-25, SAN FRANCISCO — **Advanced Sructured Analysis.** Contact: Yourdon, Inc., 1133 Ave. of the Americas, New York, N.Y. 10036.

MAY 21-25, NEW YORK — **CICS Command-Level Programming.** Contact: Sysed, One Park Ave., New York, N.Y. 10016.

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EDITORIAL

Out of bounds (Chapter 2)

We used this space just two weeks ago ["Political football out of bounds"] to oppose an order of President Reagan giving the Department of Defense selective export license review of high-technology shipments to some of our allies. Our reasoning was that, given the chronic tunnel vision affecting DOD policymakers, the job of export license review should be left to others, such as the Commerce Department.

It took surprisingly little time — less than a week, in fact — for DOD to prove our point.

In recent hearings before a Senate committee, the assistant secretary of defense for policy suggested the U.S. tighten control over exports to the Soviet bloc of commercially available small computers [CW, April 16]. He cited the Apple Computer, Inc. Apple II+ micro as an example of items "we don't want them to be able to import by the thousands."

The DOD official pointed to the "extraordinary potential of the small computer on the battlefield" as reason for controlling the flow of micros to the Soviets.

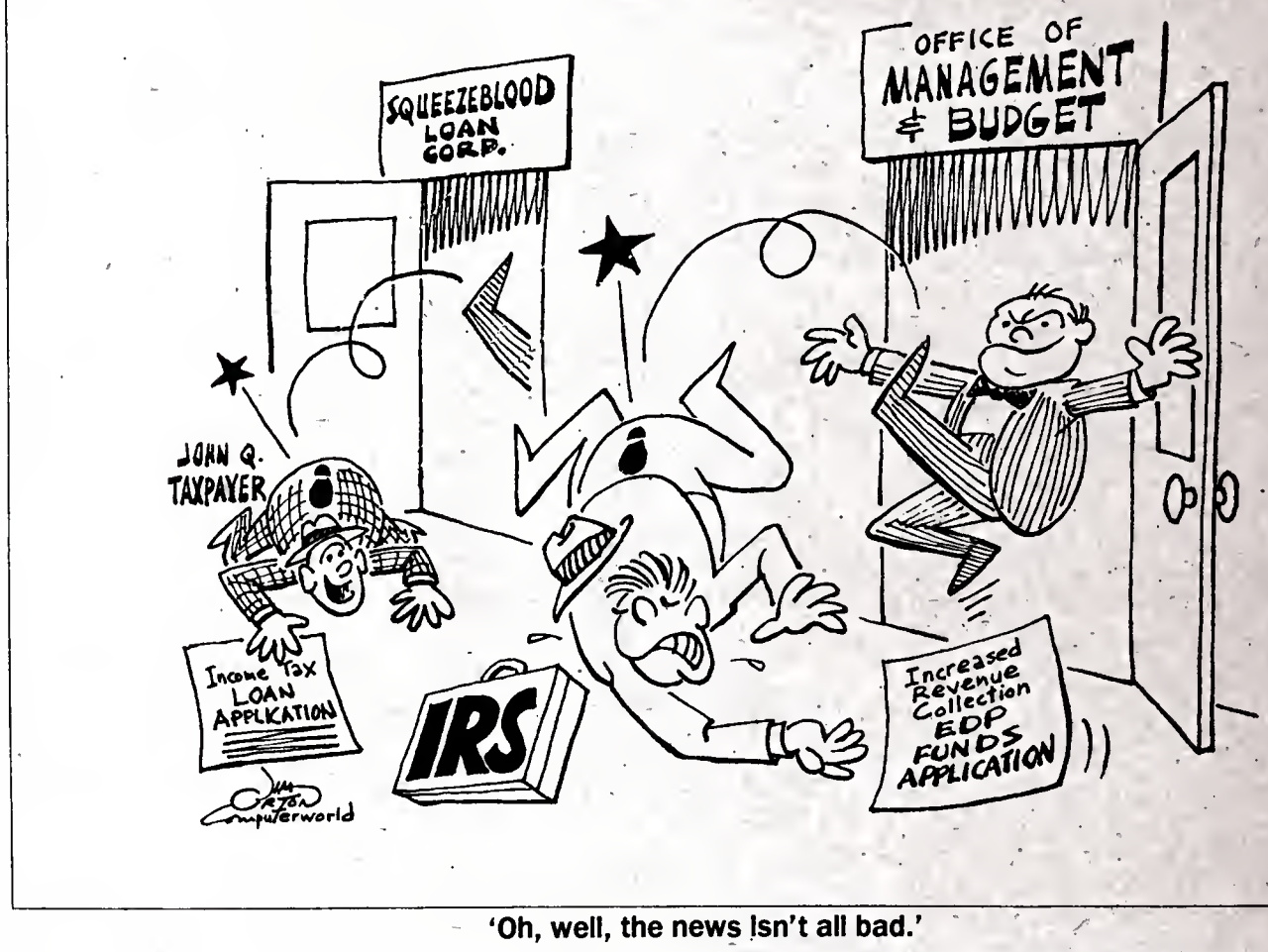
We're not arguing with the official's contentions about the strategic import of micros under battle conditions. But how about flashlight batteries? Can't read maps at night without them. Tires? Hard to move trucks or caissons without them. And let's not forget about the most important item in any man's army — food. No wheat, no bread.

All of the above items — including computers of the Apple II+ ilk — have two important things in common: The Soviets can make any one of them themselves, although not as cheaply as they can buy them elsewhere, and the Soviets can buy them in more than one country.

Virtually anything we export to the Soviets is of potentially strategic value, directly or indirectly. So the obvious question is, why bother restricting such exports when those hurt the most are often U.S. manufacturers? Or more importantly, just what do we gain by restricting these exports in any fashion?

All of which brings us to the main point — again. The DOD is woefully ill-equipped to deal with such export control matters. Intelligence and prudence have generally prevailed at the Commerce Department when it comes to the exportation of larger, truly strategic computer systems and to the export of the sophisticated gear needed to manufacture these systems and the semiconductors that drive them. The same holds true with state-of-the-art military software, which really never enters the public domain anyway.

What is needed is a rational and equitable policy on high-technology exports to the Soviets and their friends. The DOD should certainly play a key *advisory* role in the drafting of this policy. But export control should be left to those who have a more global view of reality.



'Oh, well, the news isn't all bad.'

LETTER

Was the school district at fault for not motivating student hacker?

I was interested to read the story "High school hacker to undergo counseling" [CW, March 19] about the Arkansas computer hacker who was caught and sentenced to undergo counseling.

It appears that the counseling is being given to the wrong party; in principle, forcing the student to undergo counseling is not terribly different from the Russian treatment of dissidents.

The *Computerworld* account indicates that the youth was bright, but perhaps not such a good student. This suggests that the school is at fault for not sufficiently stimulating or motivating the student.

Moreover, how mixed up could the student be if he raised his own grades and did a little snooping? The desire to get ahead is characteristically American, as is snooping (or doesn't anyone recall past government illegalities in this area?).

The school district in question reacted to the situation in the manner characteristic of brittle, authoritarian institutions that have had their shortcomings revealed: Admit no guilt, but punish the person who pointed out the emperor's state of undress.

To borrow a page from the logic manual of certain politico-religious organizations, perhaps the outrage that is being perpetrated by the authorities comes as a result of teaching "creationism" in the classroom, of having prayers in school and so on.

Howard A. Karten
Randolph, Mass.

***Computerworld** welcomes letters from its readers. Preference will be given to typed, double-spaced letters of 150 words or less; they may be edited for the purposes of clarity and brevity.*

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VIEWPOINT

Avoid 'quick-fix' techniques

THE DATA CENTER
John P. Murray

MIS has a responsibility . . . to do whatever is required to build and maintain a stable operating environment. . . . Wherever the push to move to a quick-fix effort jeopardizes the stability of the MIS operating environment, that effort must be resisted.

Some of us in the MIS profession believe in the use of a structured approach to the development of large-scale systems and in the process used to make significant changes to existing operational systems. We have learned that unless we persevere and do the required preliminary work — that is, the investigation and analysis — and unless adequate care is taken throughout the development/implementation process, the final result of the project will usually be considerably less than satisfactory.

The advent and proliferation of microprocessors, the introduction of information centers and the use of fourth-generation programming languages in the client areas have not only provided the opportunity to move many of the more mundane aspects of information processing out to the client areas, they have also brought about in the minds of some senior-level managers a perception that a great deal of the MIS effort can be carried on in a much more immediate, "quick-fix" mode.

The ease with which much of this routine work can be accomplished by people with very limited information processing experience or training in an MIS environment where the processes have been correctly installed helps to change the organization's information processing climate.

Given the relative ease with which these people can obtain answers, it seems logical to those looking in from outside that in an MIS environment where the proper interactive tools (the information center and the effective use of a fourth-generation programming language) have been provided, much of the detail and control work of the structured approach becomes unnecessary.

The result of such a superficial conclusion, particularly where the MIS clients have realized some success on their own, is to mount a campaign to circumvent the MIS bureaucracy. In this situation, MIS will see a growing effort to forget about the "unnecessary overhead" of the structured approach and to push ahead to get the job done.

There is some validity in adopting such a position. The changed MIS environment that is a result of the effective delivery of the appropriate interactive processing tools does lend itself, for a given type of work, to more free, more immediate MIS methods. A critical factor is the identification of projects that fit more immediate methods.

Victim of success

To a great extent, the MIS department that has done its job and achieved its goal of providing a truly effective interactive processing environment becomes a victim of that success. Aggressive clients will push hard to go their own way. In this environment, MIS management must continue to encourage clients in the pursuit of their particular goals where practical, yet at the same retain proper control within the realm of large-scale projects.

In such a circumstance, there is, more than ever, a real need for the MIS department to fight to maintain appropriate control for those areas in which it has ultimate responsibility. In certain situations, for instance, where the client is doing his own work with relatively simple systems and noncomplex programming, there may be room for some degree of carelessness. This is not the case with large MIS projects, whether they are new systems or enhancements to existing systems or purchased or developed in-house.

Pressure to provide more faster is certain to mount on all MIS installations. With the use of fourth-generation programming languages, it is possible to be more responsive and to produce more; but the reduction in the coding and testing time that can be accomplished through the use of fourth-generation programming languages should not be confused (although that is what happens as success is achieved with interactive processing) with any need that is less critical to the rest of the job, that is, the design, the development (or in the case of the purchased software package, the investigation), the testing and implementation of the product. These pressures to move to a quick-fix environment must be resisted.

As we work hard to become increasingly responsive to our clients, to allow the clients to manage their particular information processing needs more easily, we will find that we have to begin resisting the pressure to weaken our proven techniques.

Clearly, MIS has a responsibility to the organization to do whatever is required to build and maintain a stable operating environment. A balance must be struck between the need to accommodate the desires of the MIS clients and to protect the organization. Wherever the push to move to a quick-fix effort jeopardizes the stability of the MIS operating environment, that effort must be resisted as vigorously as possible by MIS. It is not easy; it will tend to irritate the clients and senior management, but it is right and it must be done.

The line between MIS control and chaos is, as many organizations have found much to their sorrow, very thin indeed. The inappropriate adoption of quick-fix techniques can very easily push the organization over the line from control to chaos.

Murray is director of management information services for Rayovac Corp., Madison, Wis., and author of Management Information Systems as a Corporate Resource, *published by Dow Jones-Irwin.*

Are DP managers fighting micro acceptance?

HUMAN CONNECTION
Jack Stone

The vast majority of MIS managers know full well how to respond when large masses of users become all hot and bothered about some new shiny machine. . . . 'Go slowly, very slowly, and go according to a carefully researched corporatewide information systems plan.'

In the article "Micro user sets record straight" [CW, March 19], I presented the epistle of Richard W. Hadley, vice-president for operations at Mount Auburn Savings Bank, Mount Auburn, Ind. There he says that "MIS types . . . apparently studiously ignoring microcomputers for the past six or seven years, hoping they would go away, now [are] being dragged, kicking and screaming, into the real world by the users."

Surely you've all heard similar comments proffered by sundry segments of the user population. But if you are one of us long-timers in the DP management fold, this wearisome charge is old hat.

History is repeating itself, and only the name of the technology game has changed. We've heard the same hackneyed remarks when intelligent terminals showed up, when remote batch kludges were installed and way back when the first TTY timeshare systems came on-line.

'Go slowly, very slowly'

I lean toward the view that the vast majority of MIS managers know full well how to respond when large masses of users become all hot and bothered about some new shiny machine. And that response is, and should be, to my thinking, "Go slowly, very slowly, and go according to a carefully researched corporatewide information systems plan."

In other words, I believe that DPers plan and control microcomputer introduction in an intelligent, balanced way, or at least they attempt to do so within the confines of a corporate policy that may be so liberal as to give the users whatever they want.

Haven't we all learned by now that the thrills enjoyed by many users for fondling new terminal or personal computer systems must be subordinated to ironclad insurance that the introduction of such machines — micro-based, mini-based or maxi-based machines — will be properly controlled?

That means that systems will, in fact, be viable: Software not only has the documented functionality, but it actually does run the way it's supposed to. It's not only the case that users are trained to push a bunch of keys to obtain the results they're after, but that they also have some notion as to what is really going on.

Anticipate increased work loads

Mainframe operators have been made aware of new shipments of terminal devices to the user departments, so they can anticipate increased work loads. System analysts are readied for the inundation of requests for user support. User stations are not only accessible, but they are truly operated on other than a casual basis.

May I restate the oft-stated, though often unheeded, lament that uncontrolled proliferation is anathema in the DP arena? It is equivalent to squandering preciously needed equipment dollars, to diverting the energies of talented DPers to low-priority applications and to diverting DP management's attention from more critical areas.

But it is possible that neither my thoughts nor Hadley's reflect the real "real world." Maybe he's way out in left field, and I'm far out in right. In these matters, there often is middle ground. Surely, there are some DPers who work mainly with micro users who tie into the major data bases, only setting guidelines and offering some support for others.

There are others who are too busy with mainframe issues to support micros that belong to the most influential users or those who yell the loudest. And I suppose one could always find the radical few who, as Hadley states, are "studiously ignoring micros . . . hoping they would go away" — but I don't believe it would be easy to do. ‡

Letters to Stone should be addressed to him at P.O. Box 33699, Washington, D.C. 20033.

VIEWPOINT

Hiring success depends on heeding fundamental rules

READER'S PLATFORM
Thomas J. Hutton

Recruiting the quality candidate that a corporation requires is needlessly complicated by ignoring some very fundamental rules. By following them, the time, effort and expense of the recruiting process can be greatly reduced.

The success of the end product — the person hired — can be greatly improved by following these rules:

■ Define the job. Too often, the job to be done is either never defined or is finalized as the last step in the recruiting process. The reason for this is simple: Positions are not viewed in the abstract, but in conjunction with the person filling them. We think in terms of replacing Harry or hiring another Mary rather than specifying exactly what needs to be done and what would be nice to have done. Since we never find another Harry or Mary, the hiring manager is either frustrated, because "the perfect candidate" never appears, or dissatisfied, because the person finally hired is a compromise.

The job definition needs to consist of what activities must take place (the job description); what the results must be (the standard of performance); and the desirable, but not necessary, auxiliary functions (to choose between two or more candidates who meet all the basic requirements).

■ Define the candidate's attributes. What characteristics must a person have to perform the functions of the job? This seems rather obvious, but too often managers focus on characteristics they would like a candidate to have as a person (bravery, honesty, a sense of justice and so on) rather than the characteristics a candidate must have to do the job (the ability to program in Cobol, the ability to sell integrated circuits to a consumer products company, the ability to audit financial reports and so on).

Is it, for example, necessary that a candidate have an advanced degree? If so, why? Is it necessary that a candidate have X number of years of experience performing an activity, or is it important only to have the ability to perform an activity?

The more confusion that exists surrounding necessary attributes, the less candidates will qualify and the more difficult it will be to identify the person most qualified to do the job in question.

■ Be realistic about compensation. Notwithstanding the salary ranges of the personnel department and the budgets of accounting, the real world functions on a competitive, open market basis. Far too often, a salary range is established for a position that is inadequate to attract the caliber of person required. This leads to frustrated interviews, rejected job offers and either the hiring of a candidate without the necessary qualifications or an increase in the starting salary and a new round of interviews.

Some of the reasons for unrealistic salary offers are: A departing employee was paid a below-market salary, and the new salary is predicated on the old; the personnel department supplies survey information based on averages, and the person required is not an average person or the position is not an average position; the accounting or finance department establishes the salary range with the objective of holding down costs; and a salary range is hypothecated based upon newspaper ads.

This problem is solved by letting the marketplace de-

See HIRE page 42

Hutton is a senior associate at Korn/Ferry International in Palo Alto, Calif.

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VIEWPOINT

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termine salaries. If this indicates that a company's entire compensation program is in need of an overhaul, then that problem must be solved before the one of recruiting can be addressed.

■ Use the right recruiting sources. To get the best person is possible only if a manager uses the right recruiting tool. A good dye laborer can be obtained from the state unemployment office; a Fortune 500 chief executive officer probably cannot.

Newspapers, employment agencies, employee referrals, recruiting firms, personnel departments and executive search firms can all be good solutions, depending on the specific objective. Each can also be the least costly and most timely, depending, again, on the exact requirements.

■ Conduct interviews professionally and promptly. Employment interviewing is a subject unto itself, but some observations are relevant here. Interview the candidate/applicant as soon as possible after initial contact with him is made. Don't let an individual wait weeks for an interview. Too many things can happen to change his mind, and it raises the question of how important the position really is.

Second, treat the candidate/applicant courteously, even graciously, during the interview process. Don't interrogate the candidate; don't keep him waiting in a lobby for an unreasonable period of time; don't ask him to fill out pages and pages of forms before he even knows whether he is a candidate or not; and don't view the interview as a forum to show him how important you are or to exhibit your ego.

Do remember that how you treat an individual will be a permanent reflection upon your company's reputation. It will also affect the attitude of the individual for the duration of his employment with you.

■ Make decisions quickly. Far too often, good candidates are lost because of delays in the decision-making process. One company estimated that it lost between 25% and 30% of all individuals to whom it made job offers because of a cumbersome approval process.

Why do delays lose candidates? There are many reasons, among them: Candidates find other, more attractive offers; they change their minds about leaving their present employer; they receive an unexpected raise or promotion; they forget the positive things they saw in your company; and, most important, they feel you are not very interested if it takes such a long time to make up your mind. And they are right; you've forgotten that employment is a two-way street and that a candidate wants you to be as interested as you want him to be.

If you have found the right candidate, make an offer of employment.

■ Check references. Obtain three professional references and speak with them about the person and position you have. If you use an employment agency or recruiting firm, check the references yourself. If you are using an executive search firm on retainer, ask for its write-up on references.

You can increase the probability of successful hiring by at least 20% by checking references.

■ Don't overnegotiate the job offer. Most candidates in our society aren't comfortable haggling over their worth. They want you to make an offer that both of you consider fair and reasonable. They don't want to feel that you are trying to hire them for the lowest possible dollar, the fewest possible stock options or the least available perks. They would rather work for someone else.

In addition, although it is theoretically impossible in a free market economy to hire someone at too low a salary, it happens. It happens because of candidates' ignorance of their economic worth, because they are desperate or because they have been oversold on the benefits of working for your company. And what happens when they find they have been taken advantage of? They leave.

■ Stay in touch with the candidate after the offer has been accepted (but before the start date). Why? All of us have a tendency to rethink our decisions. Your candidate does, too, and there is always the possibility of counteroffers from the other employer or another offer resulting from additional interviews the candidate has been to. By staying in touch during this two- to four-week period, you begin to cement the relationship.

■ Get the first days of employment off to a positive start. This is the time when the candidate asks, "Did I really make the right decision?" It is the time when it's easiest for him to pick up the phone and call his prior employer to see if the old position has been filled yet. It's the time when the candidate's interviewing network is still intact. Don't be premature in ending the honeymoon.

Some common first-day, or first-week, occurrences include: "Well, gee, I guess we'll have to find a place for you to sit," "Take these manuals and procedures and read them for the rest of the week," "We'll have to order a phone for you," and "Didn't your boss tell you? She'll be on vacation this week."

Make sure everything is ready for the person to begin working. That's what you hired the person for.

Finally, when the honeymoon is really over, have an informal, mutual performance appraisal discussion to clear up any misunderstandings, to ensure that the orientation process has been completed and to reinforce in both of your minds that this is now a permanent relationship. That is when the recruiting process is really over. ‡

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CW Senior Editor

College mastering real-world MIS

Business schools have long been laboring under the stigma that they are not in step with the real business world. Particularly in MIS, the institutions have been criticized for reflecting the reality of 10 years ago, when programmers were king of the information castle, rather than mirroring the data-rich environment of the modern corporation.

The recently created Master of Science in MIS program at Boston University's School of Management is now trying to tackle that issue, particularly as it relates to the integration of microcomputers and mainframes. The school is developing a series of case studies that use the micro as the primary tool for analyzing business problems encompassing large amounts of data. The Educational Materials Development Project will initially consist of eight case studies, which will be fully integrated into BU's MBA program in the spring of 1985.

The novel aspect of the project is its emphasis on using the micro to tie in to the corporate data base rather than just as a glorified calculator. According to Michael E. Lawson, director of the master's in MIS program, "Problems now being solved on micros are minuscule compared to the size of real problems. Students have to learn to deal with a lot of data, possibly based elsewhere," he said.

The case studies, which are being developed by BU management faculty in concert with MIS faculty, will be offered in a variety of courses for both MIS and non-MIS students. All cases are based on real-life experiences garnered from interviews with corporations. Students will be given some data that replicates what might be found in a corporate data base and, in some cases, will have access to sample data bases on BU's IBM 3081 mainframe. A room containing 20 to 25

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Nuclear staff eyes integration

Prototyping key to large development project

By Paul Gillin
CW Staff

SEABROOK, N.H. — What do you do when you are faced with a monstrous application development project, no other models on which to base it and a set of regulatory and user requirements that change almost daily?

Go with a system development methodology, write in a high-level language and prototype, prototype, prototype. That's the solution the Public Service Co. of New Hampshire (PSNH) is pursuing to build what it believes is the country's largest integrated nuclear information system.

The Fully Integrated Nuclear Information System (Finis) project will automate virtually all station operations at the Seabrook nuclear power plant here, which is scheduled for completion in early 1986.

Finis is designed at least in part with the intention of avoiding the information problems that contributed to the near-disaster at the Three Mile Island nuclear power plant in Harrisburg, Pa., five years ago, developers admitted. Lack of systems integration and a reluctance to share data were blamed in part for that accident.

"The key was that whatever system we used would have to integrate, not just interface," said Eric Speed, data base administrator in the Nuclear Information Systems Group. "The bottom line is that if something goes wrong with the plant, we have to fix it as quickly and efficiently as possible."

After evaluating and rejecting several packaged applications, PSNH elected to build Finis from scratch using its Cullinet Software, Inc. IDMS data base management system (DBMS), Cullinet's ADS/On-Line and Infodata Systems, Inc.'s Inquire high-level language and DBMS. When completed in early 1986 at a cost of over $6 million, Finis will incorporate six major integrated systems — including materials, work requests, radiation work permit, personnel, systems and components and document control — and 28 subsystems.

It is expected to include 350 IDMS record types, track 40,000 parts and keep records on up to 4,000 employees, Speed said. Finis will also be tied into selected applications at corporate headquarters in Manchester, N.H.

The need for integration is driven by stringent regulatory requirements and concern for safety, Speed explained. "We have to be able to track every serialized piece of equipment from womb to tomb," he said. "We want the maintenance engineer to be able to hit a PF [programmed function] key and find the parts he needs, hit another PF key and find out if they're available, and if not, find out if they're on

See **FINIS** page 52

Controversy lowers project morale

SEABROOK, N.H. — The construction site of the two nuclear reactors at Seabrook Station here is a virtual oasis of calm compared to the storm that is swirling around Public Service Co. of New Hampshire (PSNH), the utility that is building the reactors. Plagued by cost overruns and delays, PSNH has suspended construction of the second reactor at Seabrook and is seeking rate increases in a last-ditch effort to keep the company solvent. Seabrook has also been the target of numerous antinuclear protests since construction began in 1976.

All this has not directly affected work on the Fully Integrated Nuclear Information System (Finis) within the on-site DP group at Seabrook. Developers say Seabrook 1 is almost certain to be completed, if not by PSNH, then by whichever investors buy the plant. But with a slowdown in hiring in effect and an uncertain future for Seabrook, morale is a problem.

"It can get depressing with all the controversy," said Richard Boncal, Finis project manager. "I have to keep emphasizing the positive things to keep the morale high."

Boncal said the contention surrounding nuclear power has not had a major effect on hiring. However, others noted that PSNH's financial insecurity has taken its toll. "It's tough to make long-term plans here," one employee said.

!Candle

Candle Corp. has announced a version of its Epilog performance management system for IMS/**44**

Computer Associates International, Inc. released an enhanced version of CA-Universe/**44**

Softool Corp. offers a set of integrated programming tools/**44**

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Info Builders adds window-driven natural language interface

NEW YORK — Information Builders, Inc. has added a window-driven natural language interface to the new release of PC/Focus, the microcomputer implementation of its mainframe Focus package.

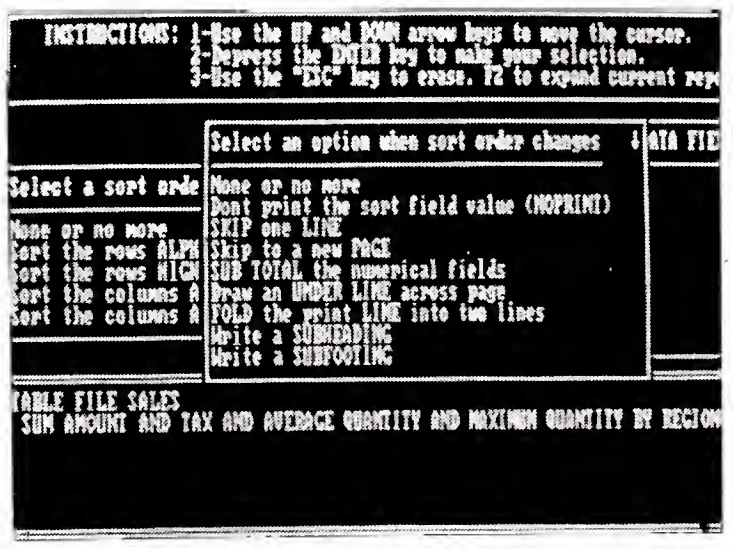
Release 1.0 of PC/Focus features Tabletalk, an interface that enables users to develop report requests without typing, and that visually assists the user through a series of static and "pop-up" screen windows that cover all phases of preparing a report request.

The enhanced version also offers Link, described as a micro-to-mainframe communication facility that enables bidirectional data transfer between PC/Focus and mainframe Focus. Link is said to support both asynchronous and IBM 3270 bisynchronous Systems Network Architecture and Synchronous Data Link Control operation using Technical Analysis Corp.'s Irma card.

Users can download information from mainframe files, including Focus, IBM's IMS, Vsam, Qsam and DL/1. Access to mainframe data reportedly is protected by Focus security, which provides password protection down to the value-within-field level.

The spokesman said data downloaded to PC/Focus can also be written automatically in Software Arts, Inc.'s Data Interchange Format for use with other micro software packages. PC/Focus requires a 512K-byte or larger IBM Personal Computer, Wang Laboratories, Inc. or Texas Instruments, Inc. microcomputer with a minimum 5M-byte hard disk.

Release 1.0 of PC/Focus is priced at $1,595 for a single copy from Information Builders, 1250 Broadway, New York, N.Y. 10001.



Tabletalk screen for PC/Focus

CA-Universe release boasts 35% more I/O performance

JERICHO, N.Y. — Computer Associates International, Inc. has announced Release 2.0 of its CA-Universe relational data base management system (DBMS) for use with IBM's DOS/VSE, MVS and VM/CMS operating systems.

According to a spokeswoman, the enhanced relational DBMS features an automatic forms/screen generator, up to 35% improvement in I/O performance, screen chaining capabilities and multiline data entry, single-screen/multirelation updating and improved sort speed.

The automatic forms/screen generator is said to enable users to generate screens from existing relations by simply supplying the appropriate data base and relation name.

It also allows immediate querying, retrieval, updating and reporting without screen or form development, according to the vendor spokeswoman.

Other enhancements reportedly include an extended program-embedable interface that allows users with high-level programs to access data contained in the data base's relations, forms security that enables the data base administrator to limit access or define who can generate or modify screens and improved updating of indexed relations with a high-performance indexing method for mass insertion updates.

Release 2.0 of CA-Universe is priced at $110,000 for DOS/VSE and $140,000 for MVS and VM/CMS installations.

Computer Associates is located at 125 Jericho Tnpk., Jericho, N.Y. 11753.

Candle's Epilog supports IMS

LOS ANGELES — Candle Corp. has announced a version of its Epilog performance management system for IBM's IMS data base management system.

Epilog/IMS reportedly permits change evaluation, retrospective problem solving, application system performance analysis and performance reporting. Epilog/IMS is also said to be able to monitor key system performance data, such as message format pool activity, data base buffer pool activity and paging rates.

An automatic analysis feature reportedly selects time periods when IMS service levels are impacted, shows the sources of degradation and displays the resource information relevant to the major source of degradation. The system performance navigator facilitates interactive exploration of IMS service levels and specifies degradation causes.

According to the vendor, the product can tell when IMS response objectives have been exceeded, what actual service levels are.

Epilog/IMS operates with IMS 1.1.6 and later releases in IBM's MVS/SP 1.3.1 and later MVS environments. It will be priced around $20,000 with availability in the third quarter of this year. Candle is located at Suite 2404, 10880 Wilshire Blvd., Los Angeles, Calif. 90024.

Softool offers integrated tools

GOLETA, Calif. — Softool Corp. has announced the Softool Programming Environment, which is described as a set of integrated tools for the management, development, testing and maintenance of software systems.

According to a spokesman, the system's menu-driven user interface can match the output from one component tool of the integrated environment to the next tool and run tools in sequence without human intervention. The commands simplify program checkout and quality assurance, prototype development and program standard setting.

The tools available with the Programming Environment include a standards and portability auditor, libraries of reusable code, tracing and testing facilities, performance optimization aids, source code and interface documenters and structured programming languages. The system is available through Digital Equipment Corp.'s External Application Software Library or directly from Softool.

The Programming Environment runs on DEC's VAX-11 processors under VMS or Unix; IBM 360, 370, 30 and 4300 series processors under VM/CMS and MVS; Honeywell, Inc. Level 66 and DPS8 processors under the firm's Gcos; Hewlett-Packard Co. HP 9000 systems under Unix and Data General Corp.'s Eclipse MV series. Prices range from $10,000 to $60,000, depending on hardware.

Softool is located at 340 S. Kellogg Ave., Goleta, Calif. 93117.

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SOFTWARE & SERVICES

SYSTEMS SOFTWARE

WESTINGHOUSE ELECTRIC CORP.
Virtue

Westinghouse Electric Corp. has announced a systems software package that reportedly provides rapid switching of a CRT terminal between computers in an IBM virtual machine environment.

Virtue is said to support virtual machine consoles in a data processing operation. A single stroke of a user-assigned program function key on an IBM 3270-type CRT terminal switches from a currently running job to any other operational virtual machine console, the vendor said. Autohold and autoclear features of Virtue monitor the ongoing activity of all virtual machine consoles from which the user has switched.

The system also features an audible alarm that signals the terminal user that a previously switched-off console screen has been altered, requires data entry or has its buffer area filled and requires attention. Console assignments may be added or deleted dynamically.

The Virtue package leases for $4,000/year, and a monthly license plan is also available.

Westinghouse Electric, Advanced Systems Technology, 777 Penn Center Blvd., Pittsburgh, Pa. 15235.

INTERACTIVE SYSTEMS, INC.
Scope enhancement

Interactive Systems, Inc. has announced an enhanced version of its Scope forms management system for Digital Equipment Corp.'s VAX-11 superminicomputers.

A spokesman said the new release incorporates an improved user interface, more flexible programmer calls and increased functionality for the Scope forms editor. The system can handle multiple forms per screen, and it allows for the underlining or boxing of fields to enhance the appearance of the screen.

Intrafield editing has been added so that a user may change selected characters in a field without altering the remainder of the data, a spokesman said. The enhanced version also features the ability to create a table of values for the validation of entered data.

The Scope editor provides a cut-and-paste capability that enables the user to create and modify forms easily. Programs written with this version of Scope may be run in batch mode with no special modifications. The Scope software licenses for $8,500.

Interactive Systems, 131 Middlesex Tnpk., Burlington, Mass. 01803.

GENERAL ELECTRONICS, INC.
Cblshort Release 6

General Electronics, Inc. has announced Release 6 of Cblshort, a Cobol precompiler for IBM mainframes.

The package is designed to make original programming, maintenance and standards enforcement easier. It can use as input any existing or new programs with or without abbreviations and can completely resequence and realign the program for easier reading and modification, the vendor said.

Cblshort will add or renumber paragraph names and change all references to them in one pass, the vendor said. It can accept user-supplied replacement strings, reportedly making migration to a data base and data dictionary easier. The vendor said that Release 6 also changes the user replacement table area to be dynamically allocated, eliminating the previous limit on the number of replacements that can be made in one pass.

The vendor said that while the system is designed for IBM mainframe Cobol source code, it will also process Cobol programs written for other compilers and can aid in the conversion to IBM systems. It is available for use under any IBM mainframe operating system.

Release 6 is leased for $50/mo. A three-year lease costs $1,500.

General Electronics, P.O. Box 79, Lyons, Ill. 60534.

PROGRAMMING CONCEPTS, INC.
Asar

Programming Concepts, Inc. has announced Asar, a programming product designed to allow the development and maintenance of Intel Corp. Isis-based microprocessor software on Digital Equipment Corp. superminicomputer systems.

Asar is said to allow the transfer of files between Isis formatted single-density 8-in. diskettes and DEC systems. Files may be transferred in either direction, with the required format corrections applied automatically, the company noted. Included with Asar is a Fortran IV subroutine library that gives programmers the ability to access Isis diskette files directly.

Asar is available for $795 plus media charges in executable format and for $1,850 plus media charges in source-code format.

Programming Concepts, 40 Orville Drive, Bohemia, N.Y. 11716.

CHAKRA SYSTEMS INTERNATIONAL LTD.
IBM System/38 software

Chakra Systems International Ltd. has introduced a software program for the IBM System/38 computer that reportedly permits the selection and omission of records in a logical file based on variable values.

The Change Access Path command is able to accomplish this by changing multiple select/omit criteria in the data description specifications

Continued on page 46

While you're waiting to see Cullinet's micro to mainframe link, these smart companies are benefiting from ours.

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A low overhead link.
OMNILINK doesn't waste DP resources. OMNILINK's data selection and extraction component lets you transfer only the data you want to download instead of an entire file. And because OMNILINK has the power of CAM™, On-Line Software's exclusive Content Address Method technology, the number of I/O requests to find the data is dramatically reduced.

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A "generic" micro to mainframe link.
OMNILINK does not lock you into any vendor's mainframe or micro software. You can use the applications you presently run on your system.

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SOFTWARE & SERVICES

Continued from page 45

and recompiling the logical file, a vendor spokesman said.

Instead of having high-level language programs read and reject records, the rejection is done by the data base management system at the machine interface level.

The software is priced at $300.

Chakra Systems, 8465 Victoria Drive, Vancouver, B.C., Canada V5P 4A8.

APPLICATION PACKAGES

FISCHER-INNIS SYSTEMS CORP.
Emc2

Fischer-Innis Systems Corp. has announced the Electronic Mail Communication Center System (Emc2), designed to operate in either IBM's CMS, TSO or CICS environments.

According to a spokeswoman, Emc2 enables users to write and send messages without using a screen editor program. Full screen menus reportedly present the system options, and electronic "in baskets" and "out baskets" hold incoming and outgoing mail. Senders receive notification when their letters have been delivered and read.

Users can set up electronic file folders to organize their mail, the spokeswoman said. Emc2 is available on a monthly lease program for $800 for IBM's OS operating system and $500 for the DOS operating system.

Fischer-Innis Systems, 4175 Merchantile Ave., Naples, Fla. 33942.

SUPEREX BUSINESS SOFTWARE
Energy Accountant

Superex Business Software (SBS) has announced a package that tracks energy conservation efforts and operates on IBM Personal Computers or compatible systems.

The Energy Accountant reportedly takes two to five minutes of work to enter and produce reports. It accommodates any fuel sources; normalizes for weather, facility size and changes in energy systems; prorates fuel and utility bills to monthly consumption; develops energy targets based on past performance; and can handle up to 75 buildings on floppy disk and 200 buildings on hard disk.

Priced at $1,000, the system includes a variety of management reports and problem-alerting features.

SBS, 151 Ludlow St., Yonkers, N.Y. 10705.

INFORMATICS GENERAL CORP.
PVS

Informatics General Corp. has introduced the Production V System (PVS), a comprehensive net-change manufacturing resource planning software system for IBM mainframe computers.

Designed for the IBM 4300 and 30 series mainframe computers running IBM's CICS and DL/1 or IMS, the system coordinates the diverse aspects of production and inventory management to help manufacturers produce products on schedule, the company said.

The price ranges from $11,000 for a single module to $130,000 for the complete system.

Informatics General, Suite 501, 701 Lee St., Des Plaines, Ill. 60016.

ROSS SYSTEMS, INC.
Maps/AP

Ross Systems, Inc. has introduced an interactive accounts payable package with cash management features for use on the Digital Equipment Corp. VAX-11 series of minicomputers.

The product, Maps/AP, reportedly provides payables processing, check writing, vendor information, cash management, inquiries and reports. Maps/AP also is said to provide automatic allocations by vendor and a vendor directory that is available at all times. It can be used as a complement to Maps/GL, the firm's general ledger/financial management package, the vendor said.

Maps/AP's multiple expense distribution previews reportedly allow users to view transactions grouped by unlimited combinations of the various levels of the general ledger account structure.

Maps/AP will be available this spring for between $15,000 and $20,000, depending on the DEC VAX-11 series model.

Ross Systems, 1860 Embarcadero Road, Palo Alto, Calif. 94303.

ACM SOFTWARE, INC.
Manufacturing software modules

ACM Software, Inc. has announced a package of manufacturing software modules for the IBM System/34 and System/36. The seven modules are written in RPG-II and share a common data base.

The Engineering Data Base module provides a bill of materials and routings. The Capacity Requirement Planning module gives long-range manpower and machine requirements. The Formal Purchase Order System module provides vendor analysis, quote processing and recording of purchase orders.

The Master Production Schedule and Material Requirement Planning module reportedly provides production forecasts and customer backlog reports and determines what materials are needed for production and the quantity and location at which they will be needed.

The Inprocess Data Base module provides orders to the shop floor, shop floor control and inventory control. The Job Inventory Costing module produces reports on actual costs. The Standard Product Costing module records cost information, accord-

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SOFTWARE & SERVICES

ing to the vendor.

Prices for the seven modules range from $1,500 to $6,500. A package price is available for between $20,000 and $25,000, depending on modules inserted.

ACM Software, Suite 402, 3001 W. Big Beaver Road, Troy, Mich. 48084.

INTEGRATED TECHNOLOGIES, INC.
Soft-Switch Document Control System enhancement

Integrated Technologies, Inc. has announced expansion of its Soft-Switch Document Control System to include support for IBM's Professional Office Support System (Profs).

The interface to Soft-Switch for the Profs user is integrated with the standard Profs mail system. Users of Soft-Switch-supported systems can send revisable form documents to Profs users with standard Soft-Switch commands, the vendor said. These documents will appear in the Profs user's mailbox.

All translation is done through IBM's Level 3 Document Content Architecture. The price for the Profs module is $10,000. The price for the Soft-Switch system ranges from $30,000 to $60,000.

Integrated Technologies, 200 N. Warner Road, King of Prussia, Pa. 19406.

VERSATEC CO.
DG version of Versaplot

Versatec Co. has announced that its Versaplot Color Random electrostatic plotting software is available for Data General Corp. processors under DG's AOS/VS Fortran 77 operating systems.

According to a spokesman, the DG version provides for plotting of eight line colors and 256 predefined area colors, as well as black and white plotting. Pen attributes, such as dash pattern and pen width, are also user-definable.

The Versaplot Color Random software for the DG AOS/VS operating systems consists of Fortran 77 and macro assembler source code. Command files enable the user to compile and assemble source code and build libraries. The package costs $4,000.

Versatec, 2710 Walsh Ave., Santa Clara, Calif. 95051.

EVALUATION AND PLANNING SYSTEMS, INC.
Micro FCS on DEC Rainbow

Evaluation and Planning Systems, Inc. (EPS) has announced that its Micro FCS Decision Support System is now available for the Digital Equipment Corp. Rainbow personal computer.

Said to be syntax-compatible with the FCS-EPS version of the decision support system on DEC VAX-11 systems, Micro FCS allows users to create a model on the personal computer, upload it to the mainframe or mini and execute the application on the larger system without program changes, according to a spokesman for the company.

Data may also be transferred downline from mainframes and minis to Micro FCS, the spokesman said.

The software is priced at $2,000 for a single copy, and quantity discounts are available, the company said.

EPS, One Industrial Drive, Windham, N.H. 03087.

AQUIDNECK DATA CORP.
Word-to-Word

Aquidneck Data Corp. has introduced Word-to-Word, a word processing conversion utility for the Digital Equipment Corp. line of computers.

Word-to-Word is said to provide document format conversion between Compu-Tome, Inc.'s CT*OS (Computome Office System) word processing, Micropro International, Inc.'s Wordstar and DEC's Decmate II. According to the company, manuscripts authored on different systems can be edited by any system. Word-to-Word can be accessed by all of DEC's office computer systems.

As an example, the company said the use of Word-to-Word allows a VAX-11 computer running CT*OS to accept a document from Decmate word processing and translate it into a CT*OS document format for editing by a VAX-11 terminal user. Similar conversions can be made between the Professional 350 with CT*OS, Wordstar on the Rainbow and the Decmate II.

Word-to-Word is priced at $2,000 for the VAX-11 and $195 for the Professional 350.

Aquidneck Data, P.O. Box 639, Newport, R.I. 02840.

DATA PROCESSING DESIGN, INC.
Version 3.0 of Word-11

Data Processing Design, Inc. has announced Version 3.0 of its Word-11 word processing software package for operation on Digital Equipment Corp. PDP-11 small business computers with DEC's RSTS/E operating system.

Version 3.0 enhancements reportedly include an advanced system management utility, scientific character set support for DEC VT100 terminals and the Diablo Systems, Inc. 630 serial printer, journaling and military-style paragraph numbering and support for the Xerox Corp. 2700 laser printer.

According to the vendor, the word processing management utility enables system managers to customize their installations by specifying access and security passwords for both devices and documents. It also has the capability to perform spooling functions with a single command, the vendor said.

Continued on page 48

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SOFTWARE & SERVICES

Continued from page 47

Prices for Version 3.0 for PDP-11s range from $8,500 for large systems to $3,500 for Micro-11s.

Data Processing Design, 1400 N. Brasher, Anaheim, Calif. 92807.

DATA 3 SYSTEMS, INC.
MRPS 38-S

Data 3 Systems, Inc. has announced a detail capacity module for IBM System/38 minicomputers.

MRPS (Manufacturers Resources Planning System) 38-S is reportedly designed specifically for the IBM system and was written completely in RPG II.

The module's features include on-line interactive processing, two-level master schedule logic and the ability to store up to 999 entities concurrently in one data base, according to a vendor spokesman.

The package is priced at $89,000.

Data 3 Systems, P.O. Box 441, Santa Rosa, Calif. 95402.

DELTA SOFTWARE SYSTEMS
Hris

Delta Software Systems has announced the Human Resources Information System (Hris), a series of six individual program modules that are available for a variety of microcomputers and minicomputers.

According to the vendor, the following modules can function independently or can be integrated: Software Solutions, Inc.'s Dataease operating system; administration program; applicant tracking; benefits plan accounting; position control; government compliance; and payroll interface.

The Hris system is compatible with Software Arts, Inc.'s Data Interchange Format, allowing the system to integrate with most popular spreadsheet, graphics and word processing packages, the vendor said.

The vendor said the software can support up to 750 employee records on an IBM Personal Computer, up to 2,000 employees on an IBM Personal Computer XT and over 2,000 employees on a minicomputer.

The micro versions of Hris range in price from $595 to $1,190 and run on the IBM Personal Computer; Digital Equipment Corp. Rainbow; Texas Instruments, Inc. Professional; Wang Laboratories, Inc. Professional Computer; and Victor Business Products, Inc. Victor 9000.

Hris modules for minis range in price from $4,950 to $10,200 and run on the IBM System/34, 36 and 38; DEC VAX-11/730; Hewlett-Packard Co. HP 3000, Wang VS-45; TI 990 and TI Business System 800.

Delta Software, 572 Washington St., Wellesley, Mass. 02181.

TECHNICON DATA SYSTEMS CORP.
Materials Management

Technicon Data Systems Corp. has announced inventory control for hospitals using the Wang Laboratories, Inc. VS series of processors.

Materials Management can function in a stand-alone mode or can be integrated with Technicon's Medical Information System software. It is said to increase efficiency for hospitals' inventory, purchasing, receiving and accounts payable departments through interactive files updated from many sources and shared with other files. Updated information reflects inventory levels at all points in the inventory cycle, the vendor said, and is available on-screen to all users.

A series of standard reports is included. Automatic purchase order generation and automatic general ledger and accounts payable interfaces are also included. Materials Management is priced at $125,000 on Wang VS 80 and higher systems.

Technicon Data Systems, 5885 Glenridge Drive, Atlanta, Ga. 30328.

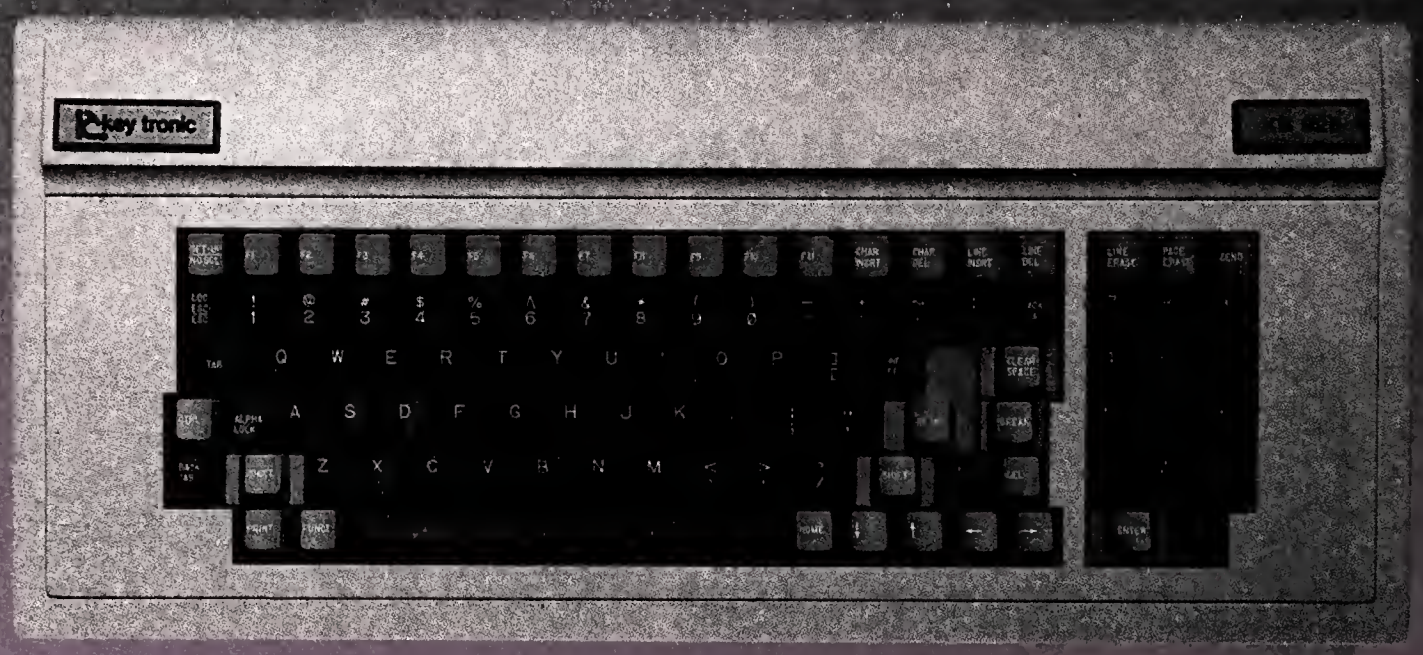
INFO PROJECTIONS, INC.
Info System Plus

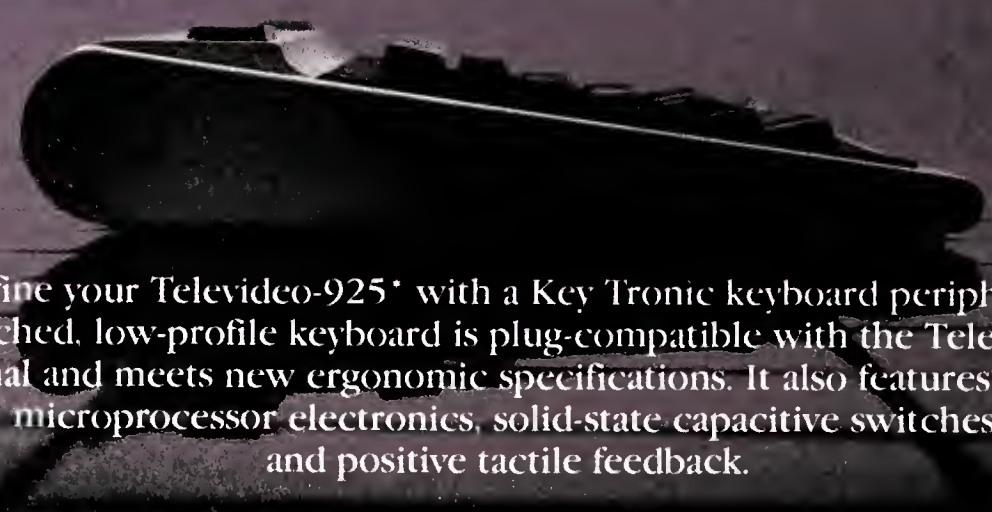
Info Projections, Inc. has announced Info System Plus, a modular mail-order processing package dedicated to interpreting market trends.

The system is menu-driven and is available for installation on the IBM Systems/34 and 36, according to the vendor.

Some of the product's applications include on-line order processing, on-line cus-

KEY TRONIC Refines The Televideo-925* Keyboard





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SOFTWARE & SERVICES

tomer service, inventory and back-order control, sales and media analysis, list maintenance, returns system, physical inventory system and hold system, the vendor said.

The package provides custom format for invoices, back-order cards, list maintenance and four-up labels. The price, the vendor said, is $24,000.

Info Projections, P.O. Box 3369, Evergreen, Colo. 80439.

SHLAES & YOUNG INFORMATION SYSTEMS, INC.
Creams and Ream enhancements

Shlaes & Young Information Systems, Inc. has announced a series of enhancements to its real estate software systems for the Wang Laboratories, Inc. 2200 series minicomputers.

The vendor said the enhancements to the Comprehensive Real Estate Asset Management System (Creams) and the Real Estate Analytical Models (Ream) packages were designed to improve ease of use, add analytical capabilities, provide additional reporting capabilities and respond to changes in the way leases are written on commercial properties.

Menus were redesigned to reduce their number and to permit movement through the systems with fewer keystrokes. The packages now also offer the user a choice of tenant-by-tenant market rent data entry or a global creation or update facility.

The Creams package is priced at $36,000, and the Ream package is priced at $9,000.

Shlaes & Young Information Systems, 405 N. Wabash Ave., Chicago, Ill. 60611.

EVALUATION AND PLANNING SYSTEMS, INC.
User Support Network

Evaluation and Planning Systems, Inc. (EPS) has announced a three-level technical support service for its FCS-EPS decision support system.

The User Support Network comprises these three levels:

■ Level one — Local support. EPS account managers are deployed on the local branch office level to provide ongoing contact and support for routine questions.

■ Level two — Regional support. EPS specialists trained to handle specific classes of applications and technical questions are resident in the EPS regional offices in Los Angeles, Chicago, New York and Toronto.

■ Level three — The System and Product Information Group. A team of systems and product technicians will be located at EPS North American headquarters and will handle both end-user application and system support requirements, the vendor said.

Support staff from Levels two and three are available for on-site consulting engagements. The cost of the User Support Network is covered by the annual maintenance fee, which ranges between 12% and 15% of the purchase price, a spokesman said.

EPS, 1 Industrial Drive, Windham, N.H. 03087.

DATA BASE MANAGEMENT SYSTEMS

SIR, INC.
Sir/DBMS

Sir, Inc. has introduced a data base management system (DBMS) that is said to run under AOS/VS and Data General Corp.'s Sphinx operating systems on DG Eclipse MV series computers.

The Sir/DBMS is a system that has the ability to support relational, hierarchical and network data structures at the same time, a vendor spokesman said.

According to the vendor, standard facilities include a fourth-generation retrieval language, a flexible report generator capable of creating camera-ready tabular output, direct interfaces to statistical packages such as SPSS, Inc.'s SPSS, on-line Help tutorials and facilities for data security and editing. The system also includes descriptive statistics as well as an interactive retrieval processor.

According to the vendor, a host-language interface is also available so users can directly access and update Sir data bases using programs written in Fortran, Cobol and other languages.

See **DBMS** page 50

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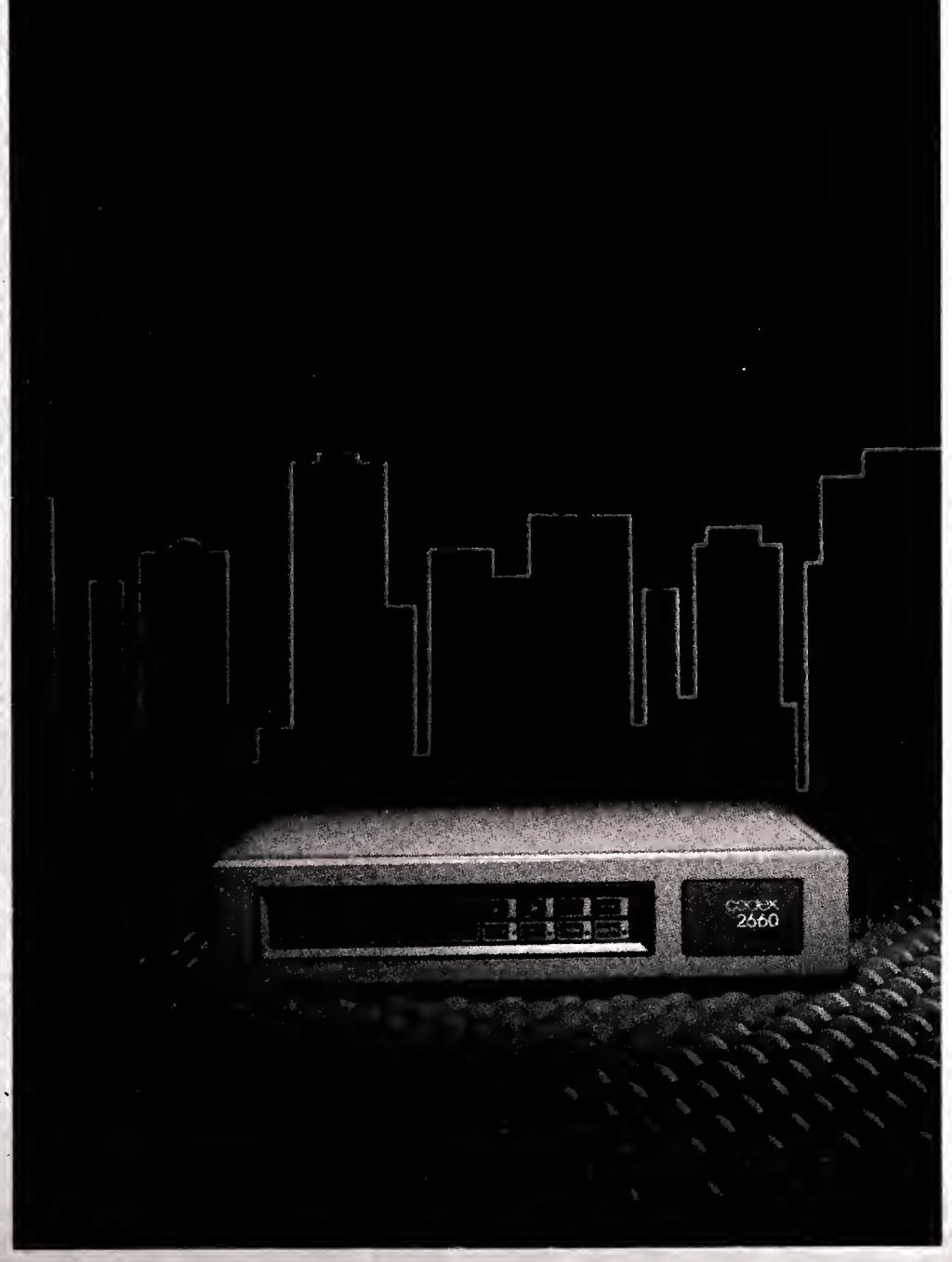

How did Codex come up with the 2600 Series, a new generation of modems running at speeds from 4800 to 16,800 bps that's so much more advanced than the competition?

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SOFTWARE & SERVICES

DBMS from page 49

Prices for a first-year license for Sir/DBMS range from $20,000 to $60,000, depending on options and CPU size, according to a vendor spokesman.

Sir, P.O. Box 1404, Evanston, Ill. 60204.

COMPUTER RESOURCES, INC.
Relate/3000 Version 4.4

Computer Resources, Inc. (CRI) has announced Version 4.4 of its Relate/3000 integrated relational data base management system (DBMS) for Hewlett-Packard Co.'s HP 3000 processors.

A spokesman said the enhanced version of Relate/3000 features improvements to the package's menu system, including an expanded online Help facility and greater user control over selection parameters. The menu system provides a fill-in-the-blanks approach to allow users to create and manipulate data bases, create custom reports and generate color graphs and plots.

In addition, Relate/3000 features enhancements to the firm's Create report writer option and the Graf color graphics option. The system works on all HP 3000 computers under HP's MPE operating system. It is priced at $18,500.

CRI, 5333 Betsy Ross Drive, Santa Clara, Calif. 95054.

DATA SYSTEMS FOR INDUSTRY
Mirror

Data Systems for Industry has announced a data base management system for users of Stratus Computers, Inc.'s Stratus/32 fault-tolerant computer systems.

The software, called Mirror, is said to feature a network structure; password security at data base and data set levels; serial, direct, calculated, chained and Isam; and multithreaded data base access.

Mirror is also compatible with Hewlett-Packard Co.'s Image/3000, providing a migration path for Image-based applications to a fault-tolerant multiprocessor environment, according to a spokesman for the vendor.

The product is priced at $15,000, the spokesman said.

Data Systems for Industry, 3942 Cerritos Ave., Los Alamitos, Calif. 90720.

VALUE COMPUTING, INC.
IDMS Accounting Subsystem

Value Computing, Inc. has announced the IDMS Accounting Subsystem, which produces performance and accounting reports and provides utilization statistics for users of Cullinet Software, Inc.'s IDMS data base management system.

The system reportedly extracts data from the IDMS log and reports IDMS internal task and transaction activity, external run units for batch programs and for tasks executing in another region and terminal activity. It includes an interface to Value's Comput-A-Charge data center accounting and billing system.

The system runs on the IBM 370, 30 series and 4300 series processors under IBM's DOS/VSE, VS-1 and MVS operating systems, according to the vendor.

The purchase price is $5,000. A 12-month lease is available for $460 per month.

Value Computing, 498 N. Kings Highway, Cherry Hill, N.J. 08034.

NDX CORP.
Creatabase price changes

NDX Corp. has announced a new price schedule, including some decreases, for perpetual licenses of its Creatabase data base management software. It also has established a monthly rental plan to introduce Creatabase.

The new prices for perpetual licenses of the Creatabase software, listed with the systems on which the product runs, are: Sperry Corp. Sperry 1100/40, 1100/60, 1100/70, $35,000; Sperry 1100/80, $45,000; Control Data Corp. Cyber 176 and 875, $50,000; CDC Cyber 175 and 170/750, $35,000; Cyber 170/760, $40,000; IBM 4341 series, $25,000; 3080 series, $45,000; 3030 series, $35,000; Hewlett-Packard Co. HP 3000 System 3, $10,000, and HP 3000/64, $20,000; Wicat Systems, Inc. System 150, $2,500; Systems 200 and 220, $5,000; Cray Research, Inc. 1/M, $75,000, and X-MP, $95,000.

Perpetual licenses are available for Tandem Computer, Inc. Nonstop and Nonstop II computers, with pricing based on their number of CPUs. Prices begin at $15,000 for two CPUs and range to $50,000 for 16 CPUs. Monthly rentals of Creatabase range from a low of $150, for use on a Wicat 150, to a high of $4,750, for a Cray X-MP, the vendor said.

NDX, 8260 Greensboro Drive, McLean, Va. 22102.

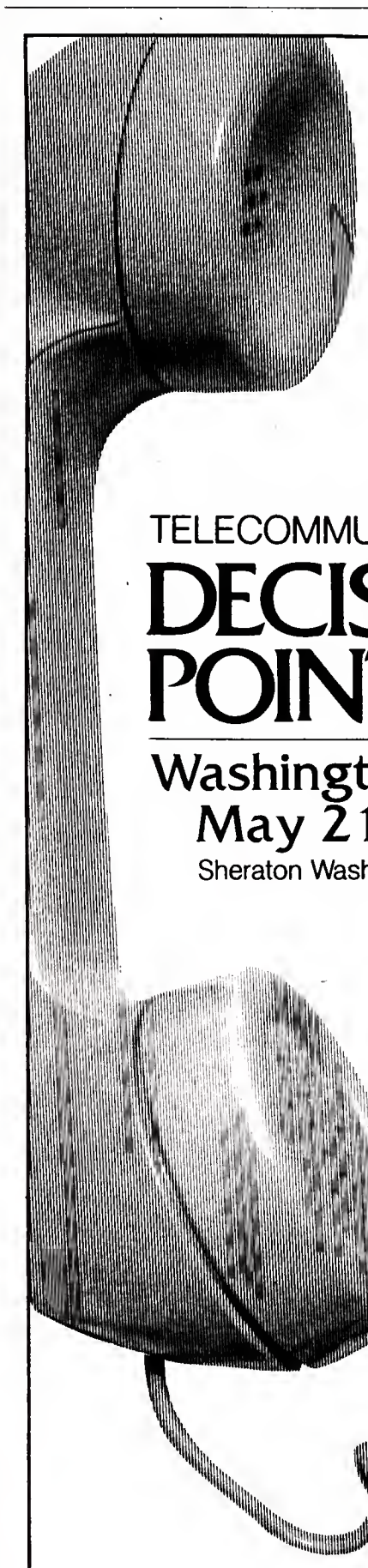
VISTA COMPUTER, INC.
Datascan enhancement

Vista Computer, Inc. has enhanced its Datascan data base software to include a cross-tabulation feature that reportedly permits users to create singularly changeable and individualized cross-tabulations.

The cross-tabulation feature is said to permit creation of comparative tables from any subset of the data base with no need to work with the entire data base.

The enhancement can reportedly deal with 250,000 records and hundreds of data fields. It is available for $20,000 for Data General Corp. Nova and Eclipse series processors and $25,000 for DG's MV series computers under AOS/VS.

Vista Computer, 85 Executive Blvd., Elmsford, N.Y. 10523.



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SIGNAL TECHNOLOGY, INC.
Smartstar 30-day trial

Signal Technology, Inc. is offering 30-day trial packages and dial-in demonstrations of its Smartstar integrated data management software. Smartstar reportedly consists of two fourth-generation software productivity tools, Smartdesign and Smartquery.

Smartdesign is the system's applications designer, and Smartquery is the fourth-generation query program for execution of those applications, according to the vendor. The Smartstar software will reportedly run on any Digital Equipment Corp. computer under the VMS operating system.

The 30-day trial package for Smartstar is available for $200 and includes a set of documentation, a nine-track magnetic tape and demonstration materials for VAX/VMS 3.1. The price of the trial package will reportedly be refunded if Smartstar is purchased within 60 days.

Smartstar is available for the following computers at the following prices: VAX-11/730, $4,000; VAX-11/750, $5,600; VAX-11/780, $7,000; and VAX-11/782, $7,000.

Signal Technology, 5951 Encina Road, Goleta, Calif. 93117.

LANGUAGES

TOWER SOFTWARE, INC.
Sleuth

Tower Software, Inc. has introduced Sleuth, a debugging package for Cobol users on Hewlett-Packard Co. HP 3000 systems.

According to the vendor, Sleuth creates a running audit trail in an easy-to-read format. It can be displayed on a screen or printed.

Sleuth sells for $1,500 for a long-term license.

Tower Software, 328 15th Place, Manhattan Beach, Calif. 90266.

STS SYSTEMS LTD.
MINI-COMPUTER SYSTEMS, INC.
VS/Basic

STS Systems Ltd. of Canada and Mini-Computer Systems, Inc. (Micos) of Elmsford, N.Y., have announced development of VS/Basic, which will reportedly allow Micos' Extensive Basic to run on all Data General Corp. 32-bit Eclipse MV series computers.

VS/Basic reportedly implements the Extensive Basic language under DG's AOS/VS operating system and permits programs written in other DG-supported languages to access VS/Basic. Other languages supported under AOS/VS include Cobol, Fortran, PL/I, APL and RPG-II.

STS Systems is an OEM supplier of DEC computers and provides the VS/Basic language for $7,000 to customers for its custom-configured DG MV series computers.

STS Systems, 9577 Cote de Liesse, Dorval, Que., Canada H9P 1A3.

REMOTE COMPUTING SERVICES

GENERAL ELECTRIC INFORMATION SERVICES CO.
Mark III

General Electric Information Services Co. (Geisco) has introduced the first product in its electronic software distribution service. The Mark III professional workstation is a software package that provides an interface to the vendor's teleprocessing network.

The product is geared toward system developers, programmers, financial analysts, business planners and data base administrators who are using the IBM Personal Computer in conjunction with GE's host processing services.

According to the vendor, the Mark III is available to Geisco clients for the cost of the teleprocessing resources used in downloading. At 1,200 bit/sec, the software and online documentation can be distributed in less than 30 minutes at a cost of approximately $50.

Geisco, 401 N. Washington St., Rockville, Md. 20850.

ON-LINE DATA BASES

BUSINESS RESEARCH CORP.
Investext

Business Research Corp. has announced that a data base of over 7,000 investment banking research reports from 28 foreign and domestic brokerage firms has been added to the Lockheed Dialog Information Retrieval Service, Inc. network.

The data base, called Investext, reportedly can be searched by industry, company, product, analyst, source publication date and Standard Industrial Classification code. With Dialog's retrieval software, data base searchers can reportedly construct their own search queries to obtain specific pages or complete reports from Investext's more than 45,000 pages of research.

Access to Investext on the Dialog Information Retrieval Service is $96/hour for connect time, $4.50/text record and/or 25 cents/bibliographic record provided off-line. Investext is also available on the Strategic Information Systems, Inc. time-sharing system for a connect time charge of $95/hour.

Business Research, 1660 Soldiers Field Road, Boston, Mass. 02135.

METHODOLOGIES

DECISION DESIGN RESEARCH, INC.
System Sizer

Decision Design Research, Inc. (DDR) has announced the System Sizer service, which is said to automate the process of requirements definition.

According to the vendor, the System Sizer service provides rapid definition and organization of system specifications for all financial applications.

Through the service, DDR reportedly processes a firm's requirements data and generates a Request for Proposal.

The service includes all required materials, charts, diagrams and descriptions in a 172-page reference book.

The System Sizer service costs $175 for all applications, the vendor said.

DDR, Box 113, Chadds Ford, Pa. 19317.

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(VM Programmer Productivity Tools)

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- SCRATCH

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FINIS from page 43

order and what other parts he can use."

Integration is also key in radiation work permits, a module that shows which employees are cleared for work in radioactive areas. The application will be tied into the site's personnel and work request modules so that a work request can immediately generate a list of employees who are cleared for the job. Since workers can only be exposed to a certain amount of radioactivity per month, "we can't afford to have the radiation work permit system down for a minute," Speed said.

To tackle the massive design process, PSNH is using SDM-70, a life-cycle methodology from AGS Management Systems, Inc. The Finis team has also used a system requirements definition tool written in-house to define data elements, business functions and transactions. It shows logical integration points and generates a business model usable during all phases of the life cycle.

Revised extensively for the Seabrook environment, SDM-70 has been "tedious, but has worked well," according to Richard Boncal, Finis project manager. Requirements Supervisor John DeWitt said that it has been effective in the uncertain environment of Seabrook, but he wouldn't recommend a methodology for all information system projects.

"A lot of things we'll need to know aren't well defined yet," he said. "This forces us to be very structured and to document procedures manually before we automate them. It gives us a processing model of how functions are carried out. From there we can go to a data model and then to a prototype."

Prototyping has been an integral part of Finis. ADS/On-Line has enabled prototype screens to be generated quickly during the coding phase, Boncal said. In addition, PSNH is using Inquire to put up a number of temporary production applications that have to be running before Finis goes on-line.

Inquire has fulfilled two basic functions, Speed said. "It helps to elicit requirements that go into the system design specs," he said, adding, "Probably 40% to 50% of our work in the data base group is devoted to making enhancements brought about largely by Inquire."

About a half-dozen complete applications have been developed under Inquire, and "we're getting new requests right and left," according to Mark Boucher, a data base analyst and principal Inquire programmer. "The beauty of it is its speed," Boucher said. "We get requirements, build a field definitions table, put it under test, build screens and present it to the user who approves it and defines what macros he wants. We've put up some systems in a couple of weeks."

When Finis is installed, the staff will save data in Inquire applications by saving it into Infodata Standard Input format and writing Cobol routines to move it to IDMS. IDMS maps will be used to parallel Inquire screens, and ADS/On-Line dialogue will replace the Inquire macros.

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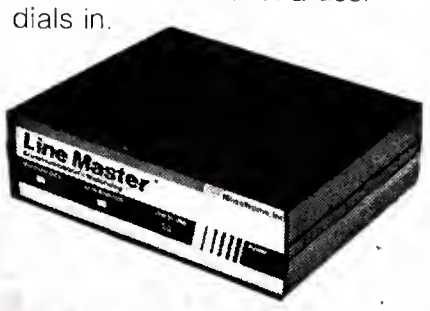

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(201) 828-4499

MBA from page 43

micros and three or four printers will be set aside with a hard-wire link to the mainframe via the campus' coaxial cable network.

As examples of the cases the students might encounter, Lawson cited a human resource management system problem in which most of the data resides on the mainframe. The students could use a mainframe-based statistical package to extract relevant data and download it to the micros. Another example concerns the voluminous data needed by managers to make merger and acquisition decisions. "There's a lot of data involved there, and the methods to use it in concert with local software are a tremendous problem," Lawson said.

Sample data bases

The sample data bases are currently being built by the MIS faculty, but Lawson said the school hopes to obtain actual copies of outdated corporate data bases for use in the future. BU is also seeking companies that might be interested in being the subject of future case studies.

Whether or not the BU experiment is ultimately successful is secondary to the idea behind it. In order to shed their nagging ivory tower image, business schools clearly must bring themselves more into line with their corporate neighbors.

The problem has been that business schools have tended to treat micros in the same manner as corporations have. They are a nice management tool, but not something that should be allowed to infringe upon the corporate data base. Schools, as Lawson sees it, "tend to just replicate typical education problems on the micro. They're using them for problems you can basically do with a pencil."

Businesses are now beginning to deal with the imposing problem of micro integration. It is encouraging to see the universities following suit.

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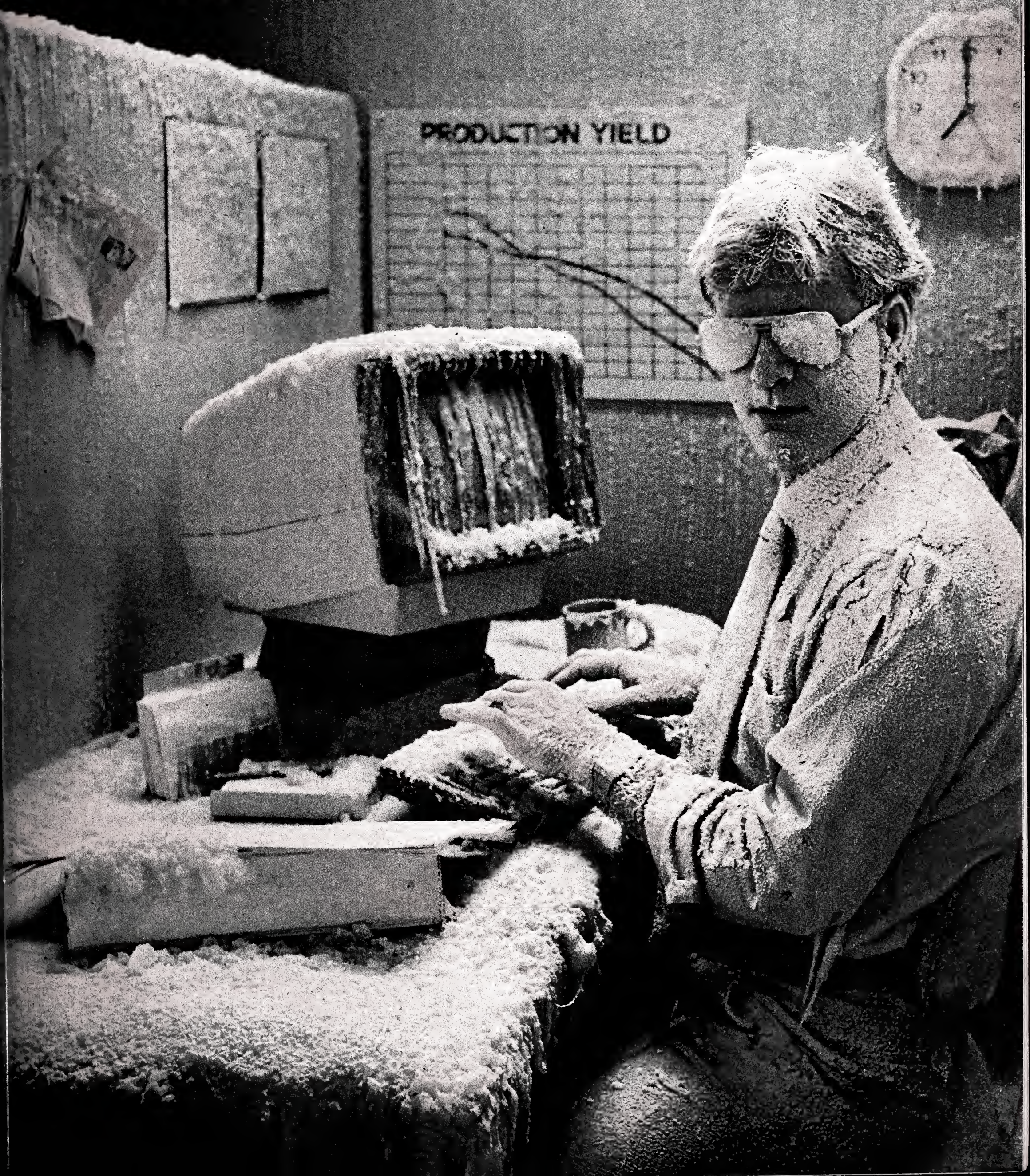
IS PRODUCTIVITY ONE OF YOUR FROZEN ASSETS?



INTRODUCING

Now for the first time you can access, analyze and graphically present data through a single, easy-to-use interface.

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What's needed is a better way to use the data and computers you already have. A way to answer questions faster and more accurately. To make better decisions.

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With productivity software from ENHANSYS. It lets you use the data and computers you already have to solve problems. And make decisions. Faster. Easier. More efficiently.

The state-of-the-art is often a state-of-chaos.

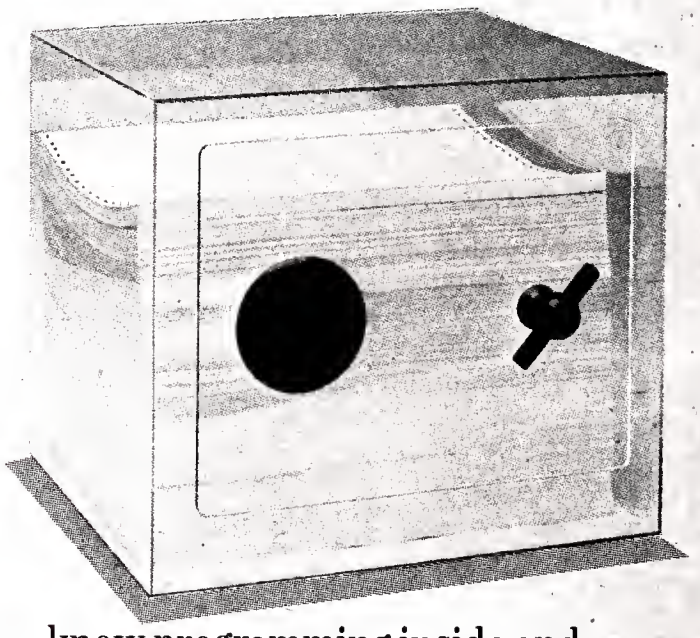
The data you need to make better decisions is already there. Only it's not easy to get to. It's frozen in all the incompatible systems throughout your company. In mainframes. In minis. In workstations.

You can't get at a problem you can't get into.

What if you could get the data you need? Could you use it? Could you transform it from computerese into meaningful information?

Not easily. Because the tools you need for data analysis aren't easy to use. And they don't work together. Which means you have to be fluent in many different computer languages.

Fact is, you're a decision maker. A problem solver. And unless you

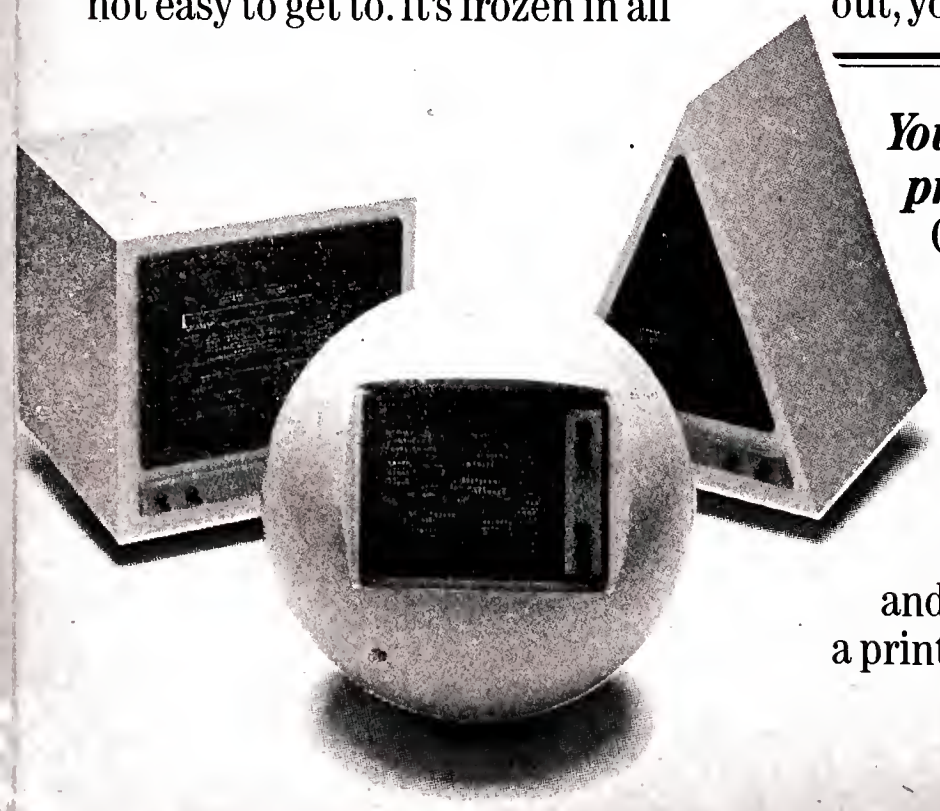


know programming inside and out, you're stopped cold. Frozen.

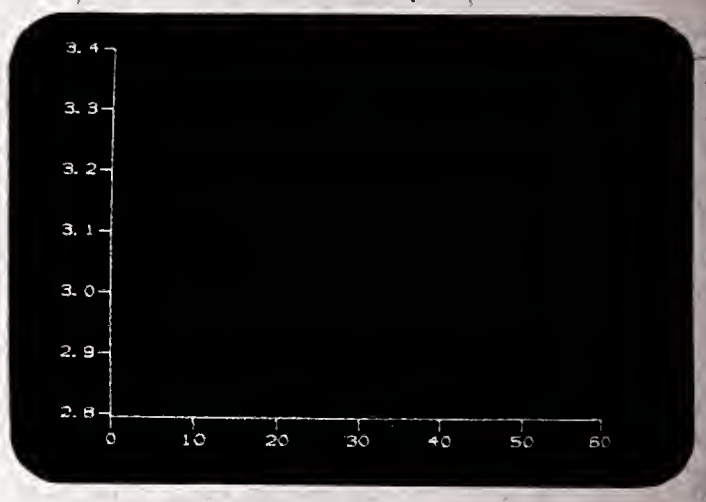
You can't visualize a problem you can't see.

Computer printouts. How do you turn them into useful information?

With a graphics software package? Good luck. Try to use it for real analysis. Try to change variables and regraph on a plotter, a printer and a color terminal.



You'll feel like someone's plotting to overthrow your sanity.



Pieces that don't fit won't solve the puzzle.

If you analyze data in manufacturing, quality assurance, research and development or general management, you're paid to make decisions. But your problem solving tools are often themselves a problem. They're awkward and incompatible. They waste your time and your company's money.

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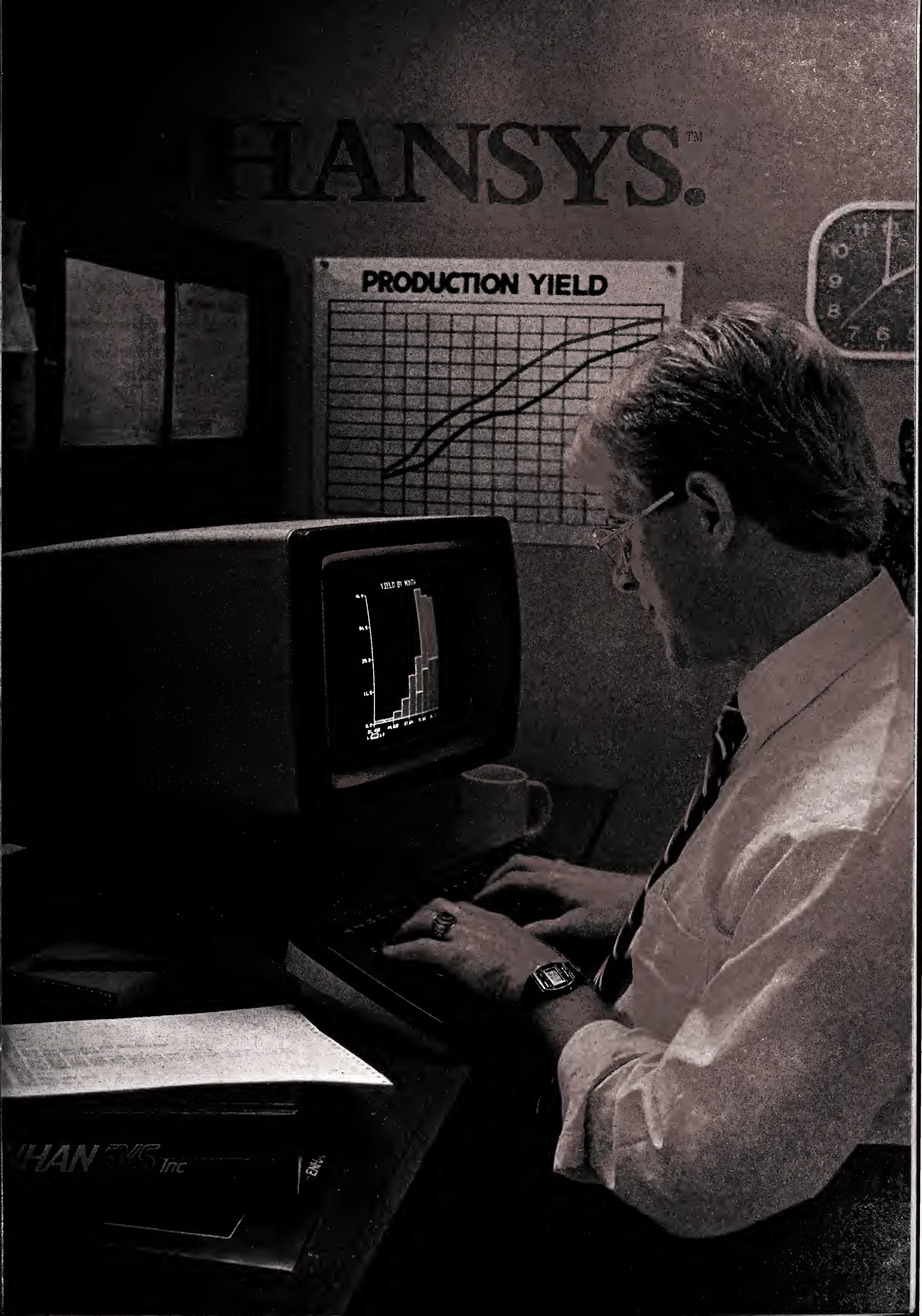


PRODUCTIVITY

Now there's a single source that expands your ability to make profitable decisions.

ENHANSYS™

Talk to your computers in a language you already know.

With ENHANSYS software, you can use simple English to get the information you need. From a variety of computers in your company network. So forget FORTRAN. Cancel COBOL. No need to go back to BASIC. With ENHANSYS software you can ask for information like you talk:

"Show me the average yield." "Give me a table of average backlog by month." "Show me names for salaries less than $25,000."

It's this simplicity that makes ENHANSYS software so easy to use. Everyone in your company can use it. So you can ensure timely feedback for you and your people. And give yourself time for more productive work. Like thinking. Planning. Strategizing. And making decisions. Instead of responding to crises.

The answer's in the dictionary.

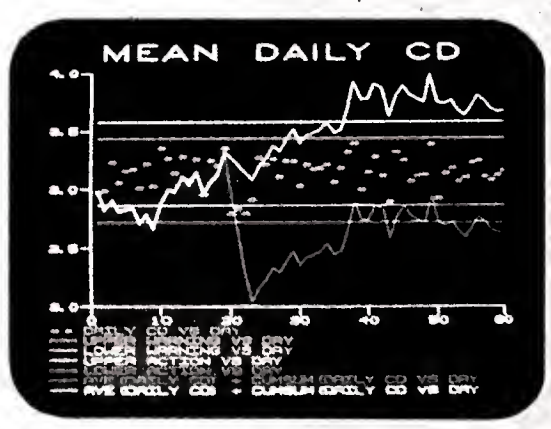
Our software system uses an unusual "dictionary." All you have to know is what information you want. The dictionary knows where to find it and how to present it. You ask for it and it appears. The "where, what, why and how" of finding the data is all handled for you. It's also easy to install and maintain and doesn't compromise your company's data security.

ENHANSYS lets you leverage your existing computer resources. It works with a variety of systems. Like IBM, DEC, HP, Tandem, UNIX systems and more.

Get to the bottom of the issue right off the top.

So you've got the data. What then? ENHANSYS software gives you everything you need to manage and analyze it. Like sophisticated, yet easy-to-use sorting, screening, grouping and table management capabilities. Plus a complete range of statistical and mathematical functions. So you can look over the numbers without having them overwhelm you.

Put the problem on the table. Or a chart. Or a graph.



With ENHANSYS software, you get the whole picture without going through a whole production. Then after you analyze your numbers mathematically or statistically, you can display them as intelligible, understandable information.

Enter the command "TRENDLINE" and perform a linear regression. And plot the line directly onto a graph with your original data. In full color. With a hard copy for hard evidence.

All the tools you need in one kit.

You get all the tools you need to do your work—and all the tools work together. They're totally integrated, sharing the same data, using the same, simple-English

UNLIMITED.

commands, operating identically no matter what system you're on.

The ENHANSYS system is also very accepting. Its open structure easily accepts third-party software. Or software developed by your programmers. And as your needs grow, you can easily add more functions.

On line in many production lines.

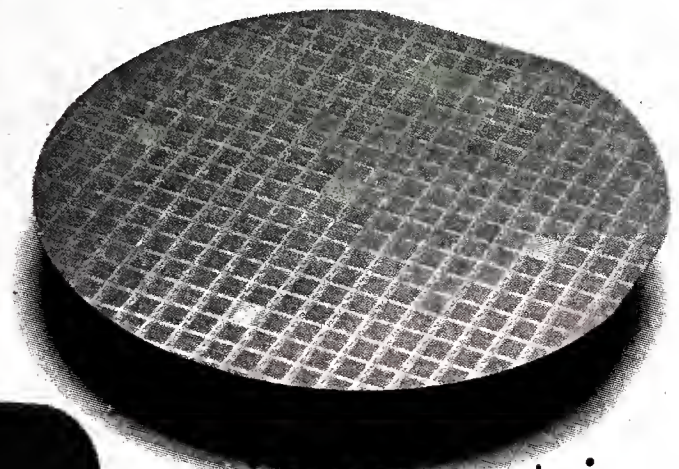
For sorting, screening and analyzing masses of data without making a mess, nothing is better.

For example, in discrete manufacturing, the ENHANSYS system is discretely minimizing rework and scrap through quality control sampling. In wafer mapping for graphic analysis of semiconductor characteristics, it's showing the route to higher productivity. In process control, it's stamping out inefficiencies and maximizing yields.

And there's even more it can do. Like sales and product mix analysis. Product cost reduction studies. And inventory analysis.

How to maximize results in semiconductors.

Here, where process control is everything, we're helping to save



megabucks by increasing yields.

Time was when an engineer found a problem in manufacturing he needed "get up and go." Get up and go—all over the company—to collect and analyze data. All while the entire production line was shut down. At a cost of hundreds of thousands of dollars.

No more. The ENHANSYS system can link manufacturing data sources and give you the tools to closely monitor the entire manufacturing process. All through a single terminal. So now, that same engineer is delivering a virtuoso performance, dramatically boosting yields and cutting waste.

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Software that helps you be more productive is only part of our business. We've taught over a thousand professionals some valuable lessons. We conduct classes in applied statistics, experimental design, quality control and decision-making techniques.

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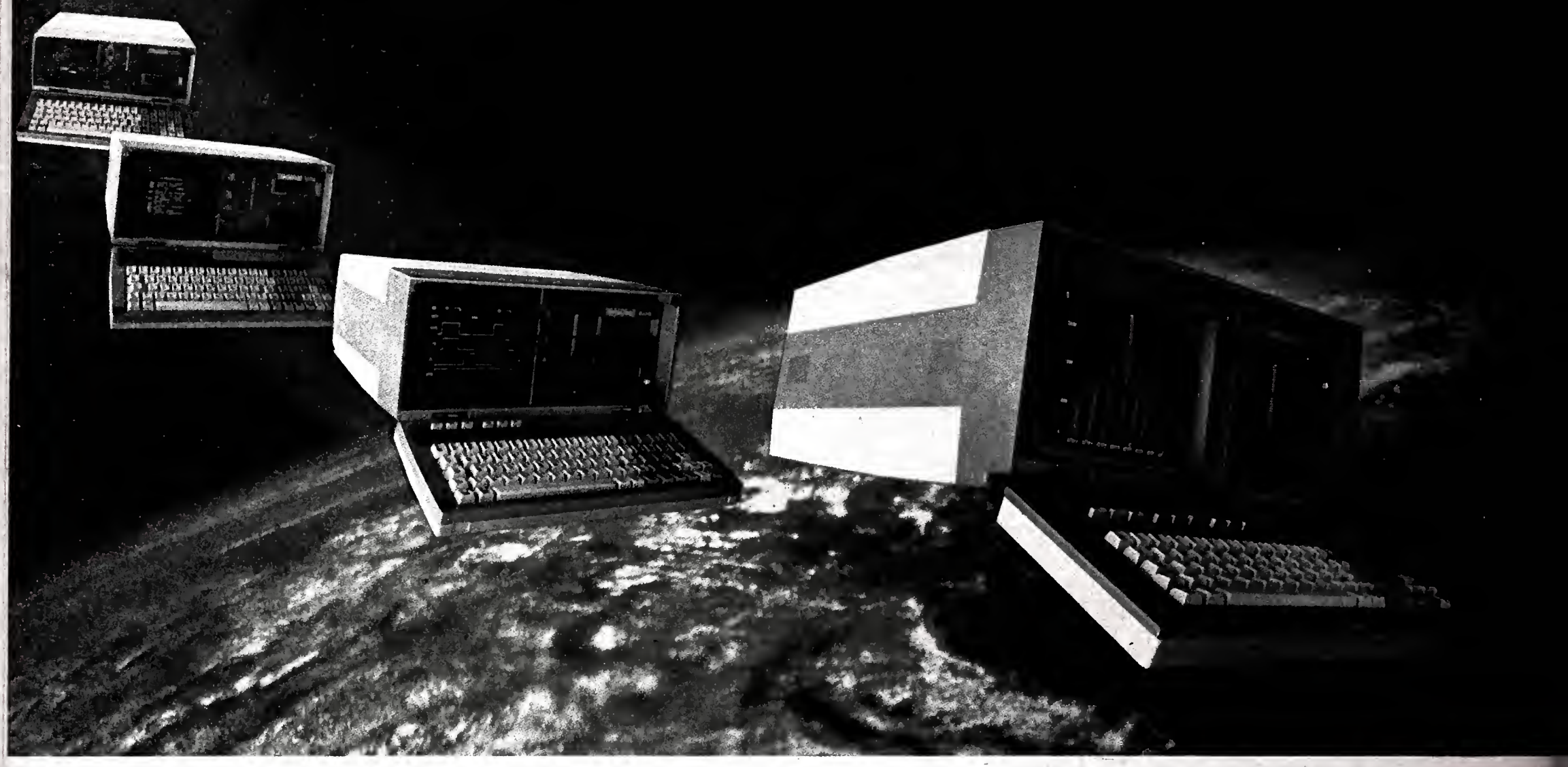

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COMMUNICATIONS

Firm taps PBX to boost computer accessibility

NAPERVILLE, Ill. — Necessity is not only the mother of invention, sometimes it is also the catalyst for change. When a chemical company here needed to expand computer accessibility without incurring more costs, tapping into the data communications capabilities of the already installed private branch exchange system proved a viable solution.

In 1979, Nalco Specialty Chemical Co. installed a Rolm Corp. Central Branch Exchange (CBX) and used it solely for voice. Sometime later, a problem began to develop in its data processing departments: Each time another employee needed computer access, the company would have to lay more cable for a point-to-point installation that would cost as much as $1,000. However, the majority of users only required computer access 20% of the time, a decreasing percentage with increased personal computer usage.

Compounding the problem was the fact that certain users needed two terminals on their desks in order to access program tools and informational data bases supported by their multivendored MIS group.

Noting that Nalco needed a solution that would allow it to expand computer accessibility without incurring more costs, Diane Blake, the company's corporate office facilities manager, suggested trying the data communications capability of the Rolm CBX.

Use of installed wires

The data communications product would allow the company to transmit both voice and data using standard telephone wiring. Use of the installed telephone wiring would give all employees access to the computer resources, if needed, and employees could access any MIS data base from one terminal.

Jerry Pike, manager of technical support and operations, agreed to install 16 data terminal interfaces on a test basis because he did not believe the CBX could handle voice and data simultaneously as described. (Data terminal interfaces provide the connection between digital devices, such as terminals, and analog telephones.)

Two months after the trial, Pike said, "The CBX has provided a single-vendor solution to a problem that had required a multivendor approach. It has surpassed my expectations in fulfilling its specifications."

"To tell you how it's working out — we started with 16 data terminal interfaces, and we now have 90 installed," Blake said. "That figure will go up because we're changing the processor on the system, so we'll have more capacity."

Momentarily, the company's Rolm 7000 processor will be changed to a Rolm 8000 processor, and the Datacom II feature, which will give Nalco even greater capacity for data, will be installed.

Even further plans for upgrading the voice/data system are in store for Nalco. "In about a year and a half, we're upgrading to the Rolm CBX II system," Blake said. "Obviously, we're very satisfied."

INSIDE

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Vendor service found key in telecom selection

By Lynn Haber
CW Staff

Vendor reliability is equally important, if not more so, as cost when selecting a telecommunications system, telecommunications managers indicated to *Computerworld* last week.

When asked in a telephone interview what criteria were important when purchasing a telecommunications system, managers said that other than the fundamental position of the vendor to provide a system on a given date, key factors in the decision-making process were service and support and vendor viability (financial strength and market share).

"Cost is not always the big issue," according to Charles Hlavac, telecommunications manager of Crowley Maritime Corp. in San Francisco. "The real problem is service once you've installed the system. Some vendors simply walk away, and you're lucky if you can get support after that time."

For Hlavac, once the fundamental position of the vendor is established, the technical features of a system and system sophistication are investigated. "If we're dealing with a national company that has wholly owned subsidiaries, then we make a field trip to look at other installed equipment," Hlavac said.

> *I'd have to say vendor reliability, which includes service and support, is most important. Then follows performance, viability of the vendor and cost. —*
> Harry M. Venable, director of communications at Celanese Corp.

"We also look at the warehouse situation and then attempt to determine the actual number of private branch exchange technicians this vendor has in a particular geographic location. One thing you don't want to end up being is someone's first customer."

For Denise Ray, telecommunications manager at the University of Maryland in College Park, a vendor's technical ability — in which she includes service and support — rates on a 50:50 standing with cost.

Another criterion Ray considers important in the selection of a telecommunications system is the system's ability to be multifunctional. "Voice and data communications capabilities are both important," Ray said, "and as a university, we also have some need for video applications.

Ray also said that "the ability to make changes and optimize a system by internal control rather than external control by the vendor is also very important."

While most telecommunications users would ideally like to get the best equipment at the lowest price, this approach is not necessarily realistic. According to Harry M. Venable, director of communications for Celanese Corp. of Charlotte, N.C., system cost is important, but not as important as other criteria.

"I'd have to say vendor reliability, which includes service and support, is most important. Then follows performance, viability of the vendor and cost."

Free guide offers info for managers about consultants

WILLOWDALE, Ont. — Angus Telemanagement Group, Inc. is offering free copies of its recently published "Managers Guide to Telecommunications Consultants."

The eight-page booklet consists of information about the consultant's role, the services consultants can provide, pitfalls to avoid and other information of interest to managers.

Further information is available from Angus Telemanagement Group, Suite 210, 2175 Sheppard Ave. E., Willowdale, Ontario, Canada M2J 1W7.

Accunet's NY-London service debuts

NEW YORK — In partnership with British Telecom International, AT&T Communications, Inc. recently began offering its International Accunet Reserved 1.5 Service to business customers.

The service offers full-color international video teleconferencing between New York and London, according to AT&T Communications. International Accunet is a digital, two-way service that operates at 1.544M bit/sec.

While the service is capable of transmitting both voice and data communications, it was designed primarily for teleconferencing, which is said to be the most economical use of the service.

Typical charges for a service transmitted via the AT&T portion of a transatlantic circuit between New York and London would be $625 for 30 minutes, an AT&T spokesman said.

Similar charges would be paid by the London customer to British Telecomm International for the portion of the circuit it would provide, according to AT&T.

Connects 11 cities

Business customers outside of New York will have access to the London-to-New York service through AT&T's domestic Accunet Reserved 1.5 Service. This service connects public video teleconferencing facilities in 11 major cities, according to AT&T.

According to the AT&T spokesman, the company plans to include other international locations in the future.

Additional information is available from AT&T, which is located at 550 Madison Ave., New York, N.Y. 10022.

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So if you're looking for ways to lower your computing costs, take a look at the HP 3000. Call your local sales office listed in the white pages and ask a Business Computer Specialist about the HP 3000. Or write for more information to Tom Rappath, Hewlett-Packard, Dept. 03185, 19447 Pruneridge Avenue, Cupertino, CA 95014. In Europe, write to Henk van Lammeren, Hewlett-Packard Nederland B.V., Dept. 03185, P.O. Box 529, 1180 AM Amstelveen, The Netherlands.

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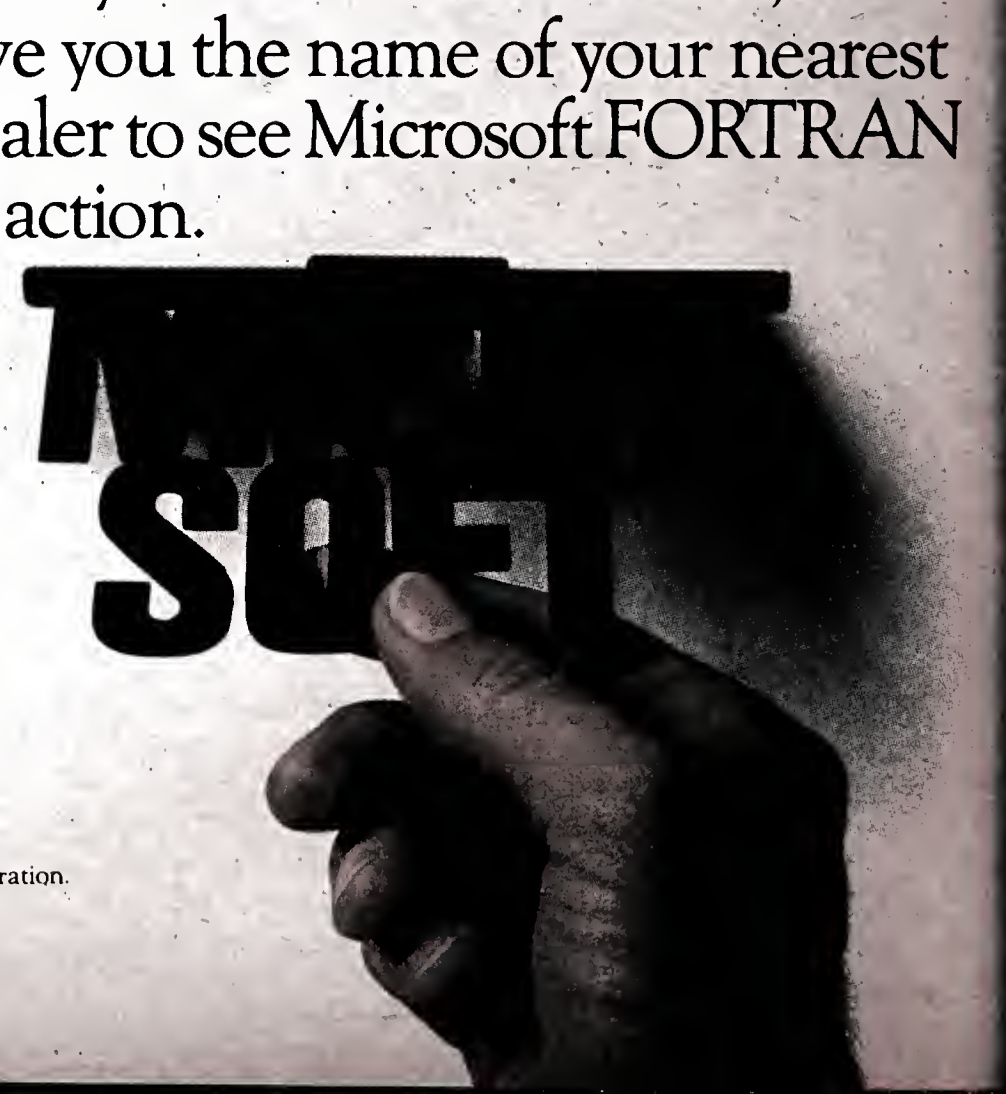

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COMMUNICATIONS

PROTOCOL CONVERTERS

MODEMSPLUS, INC.
SNA-P

Modemsplus, Inc. has announced the SNA-P protocol converter, which reportedly interfaces any personal computer, minicomputer or dumb terminal to an IBM Synchronous Data Link Control/Systems Network Architecture mainframe via dial-up lines or leased lines or direct connect to an IBM 3705 front-end processor.

The product offers error detection/correction, a menu-driven display of selectable features and operates as a stand-alone, single port box, the vendor said.

The price is $1,295.

Modemsplus, 217 E. Trinity Place, P.O. Box 1727, Decatur, Ga. 30031.

MULTIPLEXERS/ MODEMS

COMDESIGN, INC.
TC-500A

Comdesign, Inc. has announced a 32-line TC-500A statistical multiplexer that features Flexpak modular firmware.

Flexpak allows users to field upgrade their units with the latest Comdesign software releases. The new enclosure can reportedly be configured from four to 32 channels and offers network monitoring, statistics gathering and network diagnostics among its standard features, a company spokesman said.

Each channel can be programmed for any combination of 5- to 8-bit bytes, with even, odd or no-parity, and 1-, 1½-, or 2-stop bits. Speed selections range from 50 to 9,600 bit/sec, including two split speeds: 1,200/75 bit/sec and 1,200/150 bit/sec, the vendor said.

The price for the four-channel unit is $1,700.

Comdesign, 751 S. Kellogg Ave., Goleta, Calif. 93117.

FIBRONICS INTERNATIONAL, INC.
Model FM 1699

Fibronics International, Inc. has announced an eight-port coaxial cable multiplexer designed for users of Memorex Corp.'s 2074 controller.

The multiplexer operates with 2078, 2079 and 2086 Memorex peripherals. It multiplexes eight controller ports over a standard coaxial cable at distances up to 4,000 ft. Each supported peripheral can be separated by 1,000 ft from the multiplexer, a company spokesman said.

The price is $2,200 per pair.

Fibronics International, 218 W. Main St., Hyannis, Mass. 02601.

SOLANA ELECTRONICS
Model 822

Solana Electronics has introduced the Model 822 multiplexer.

The multiplexer has an eight-channel capacity and allows computers and terminals to be separated up to 2,000 ft. Modems are not required, according to the vendor.

The product features data rates up to 9,600 bit/sec per channel with unrestricted intermix of speeds and codes, a company spokesman said.

The price is $495.

Solana Electronics, 249 S. Highway 101, Solana Beach, Calif. 92075.

MULTI-TECH SYSTEMS, INC.
Multimodem

Multi-Tech Systems, Inc. has announced Multimodem, a 300 to 1,200 bit/sec modem that has an internal battery-backed memory for up to six 31-digit phone numbers. These numbers can be automatically dialed once or continuously until the call is answered, the vendor said.

The modem's command mode is compatible with the Hayes Smartmodem 1200 commands and with most popular microcomputer communications packages, a company spokesman said.

Some of the product's features include: pulse or tone dialing, line and call status display, keyboard or stored number dialing, automatic parity and data rate selection and automatic parity and data rate selection. The price is $549.

Multi-Tech Systems, 82 Second Ave. S.E., New Brighton, Minn. 55112.

CTS CORP.
Companion

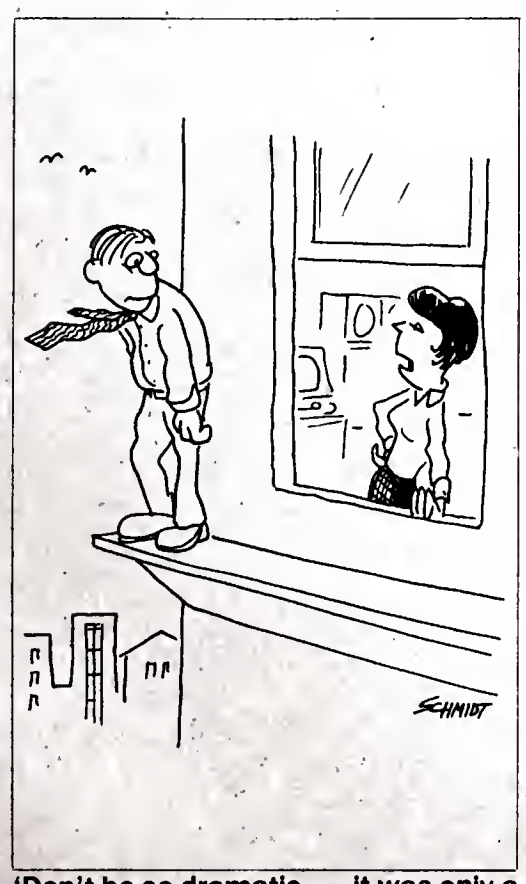
CTS Corp. has introduced Companion, a Bell Laboratories 212A-compatible modem that can reportedly be connected to the RS-232 port of more than 100 types of personal computer configurations or can be menu driven from the keyboard of data terminal equipment, a company spokesman said.

The modem allows asynchronous, full-duplex operation at 300 and 1,200 bit/sec and synchronous operation at 1,200 bit/sec. The unit supports keyboard diagnostics, including local analog loop-back, local digital loop-back and remote digital loop-back test.

Additional features include adaptive dialing, automatic answering and speed detection call progress monitoring, automatic storage and dialing of last phone number and two RJ11C jacks for both voice and data communications, according to the vendor.

The price is $495.

CTS, 400 Reimann Ave., Sandwich, Ill. 60548.



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COMMUNICATIONS

TEST EQUIPMENT

DIGILOG, INC.
Digilog 200, 400, 600, 800

Digilog, Inc. recently announced the 200, 400, 600 and 800 series of automatic protocol analyzers.

The Digilog 200 features automatic setup, remote control, menu-guided operation, fill-in-the-blanks programming, English language prompts and Help screens and typewriter-style keyboard.

Other products in the line accommodate increasingly higher speed lines and capabilities. The 400 is for lines operating at up to 56K bit/sec; the 600 device is for 72K bit/sec lines; and the 800 is meant for use with lines operating up to 256K bit/sec.

The 800 series incorporates a 10M-byte Winchester disk, color CRT and Sony Corp. of America micro floppy and offers multilevel program operation.

The price for the Digilog 200 protocol analyzer is $4,995; the 400 with disk drive is $8,295, $7,495 without the disk; the 600 is priced at $11,500; and the 800 costs $18,500.

Digilog, 1370 Welsh Road, Montgomeryville, Pa. 18936.

AUXILIARY EQUIPMENT

WESTERN UNION CORP.
Price changes for Easylink

Western Union Corp. has announced new pricing for its Easylink instant mail service, which requires no registration fee and no monthly service charge for subscribers as of April 1.

For the first 90 days after signing up for the service, users will have a minimum monthly usage charge of $25, a company spokesman said.

The service contains protocol and speed and code conversion software that enables users to communicate over telephone lines with any other user on the network.

Western Union, One Lake St., Upper Saddle River, N.J. 07458.

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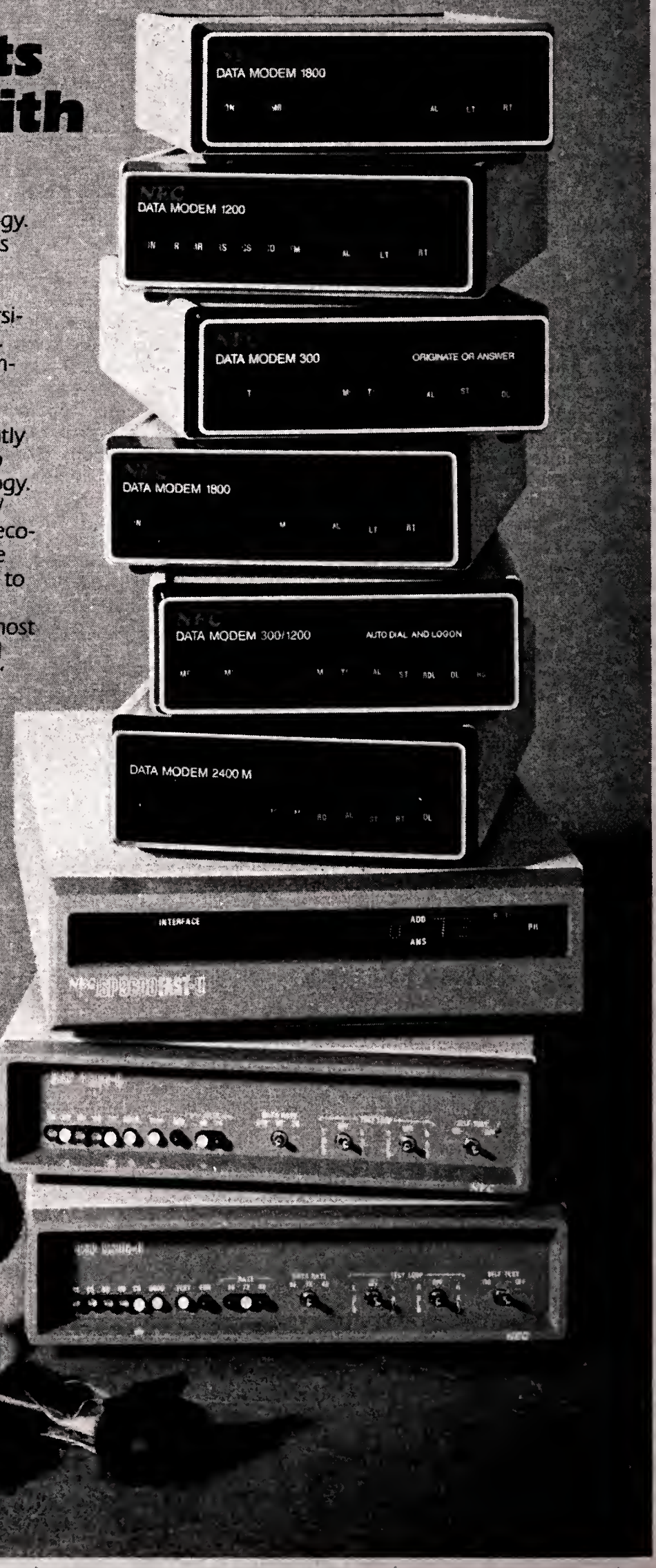

SYSTEMS & PERIPHERALS

Optical disks promising, but misunderstood

By Tom Henkel
CW Staff

FRAMINGHAM, Mass. — Despite positive predictions for its future, optical data storage still has its problems, not the least of which is that users somewhat misunderstand it. According to a recent report, optical data storage's expense and unreliability and the misconception that optical disk media cannot be erased are some reasons more users have not jumped on the optical bandwagon.

Optical disk storage has long been touted as one way large system users might fight the growing capacity, speed and space problems associated with conventional magnetic media disk drives. The advantages of optical storage, noted the report's publishers, International Data Corp. (IDC), have been touted for some time. These include the users' ability to switch randomly from one section of a disk to another very quickly. And since optical disk drives use lasers instead of read/write heads, the chances of a head crash are virtually eliminated.

Furthermore, it is easy to remove and store the optical disk platter. With magnetic media disk drives, removable pack drives have sometimes caused problems when the disk media has been contaminated by dirt. And optical disks offer the ability to store both data and images, thus opening a new world of data storage to many users.

But there are problems, too. Optical disk drives are expensive. IDC noted that optical drives for larger systems range in price from about $6,000 for a unit with a 1G-byte capacity to upwards of $200,000 for the so-called "jukebox" units, which can accommodate multiple disk platters. And the disks themselves are also expensive. The firm said a 1G-byte optical disk platter costs from $150 to $350.

IDC predicts the prices for optical disk drives probably will not come down until more vendors start mass-producing them. But even though the initial cost is high, the market research firm was quick to note the cost of 1M byte of optical storage is significantly less than 1M byte of storage on magnetic media disk drives. For example, a 4G-byte optical disk drive costs roughly $5 per 1M byte of storage. IBM's top-of-the-line 3380 magnetic media 3380 disk drive costs roughly $40 per 1M byte, and conventional magnetic tape drives cost roughly $150 per 1M byte, IDC said.

Year	Shipments*
1983	1**
1984	40
1985	90
1986	210
1987	510
1988	1,600
1989	4,400
1990	8,700

* Does not include controller
** Includes preproduction models

Reliability is another issue that has caused some manufacturers to shy away from the development of optical drives. The report noted that the bit error rate on optical disk drives appears to be significantly higher than on conventional magnetic media drives.

For example, manufacturers of magnetic media disk drives can produce a disk media that has a fairly error-free surface. For example, using error correction codes (ECC), which are basically a series of algorithms aimed at pinpointing faults, manufacturers of magnetic media storage products have been highly successful in lowering error rates. However, the overhead required to support the ECC can be high, often taking up 10% to 50% of a disk platter. But the overhead required for error troubleshooting is even higher on optical disk drives, IDC reported.

The market research firm said some 1G-byte optical disks drives on the market use from 200M to 500M bytes of storage for error correction. While the remaining 600M to 800M bytes is still a huge amount of storage, IDC noted that when the actual storage capacity is considered, the economy of optical disk drives may begin to pale when compared to magnetic media devices.

Furthermore, the report stated, the number of errors that occur in the optical process are high when compared to magnetic storage. For example, IDC said an error on an optical disk is possible every 1 X 10^{-5} to 1 X 10^{-6} bytes. That means an error could occur in every 100K bytes to 1M byte. Magnetic media disk drives have an error rate ranging from 1 X 10^{-9} to 1 X 10^{-14} bytes.

The report noted that for DP applications, disk error rates have to be in the 1 X 10^{-12} to 1 X 10^{-10} to be acceptable to users.

Possibly due to the problems associated with the optical drives, such as the bit error rate, nonstandardization and a lack of control software, IDC said the optical market has been a slow starter. The firm noted that some domestic firms have pushed back initial delivery dates on optical products.

But Japanese firms, like Hitachi Ltd., have already begun shipments in Japan and will probably begin domestic deliveries in late 1984.

The report also noted that many users have the misconceived notion that optical disks are not erasable. Actually, the report explained, there are three techniques commonly used to record data on optical disk drives, and only two of them are permanent. The ablative technique uses a high-power laser to burn a hole in the disk media. A similar bubble technique forms a tiny blister between a metal layer on the disk and the disk substrate. The third

See **DISK** page 76

■ Decision Data Computer Corp. announced a workstation for IBM's System/38, System/36 and System/34 processors that also features compatiblity with the IBM Personal Computer/**66**

■ Ford Higgins Ltd. recently unveiled a general-purpose minicomputer based on DEC's PDP-11/23/**66**

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VAX-11/750-based superminicomputer released

WESTMONT, Ill. — First Computer Corp. has announced a superminicomputer system based on the Digital Equipment Corp. VAX-11/750.

The Orion 750-I offers twice the speed, capacity and performance of First Computer's Orion 730 system, according to the company.

The Orion 750-I features 2M bytes of memory and 134.8M bytes of formatted storage provided by a fixed storage drive disk emulating dual DEC RM03 drives. Mounting space is available for an additional fixed storage drive or a 67.4M-byte removable storage drive.

The system includes an autoloading, self-threading 92M-byte tape drive for backup, a free-standing DEC LA120 Decwriter III printing terminal and a license for DEC's VAX/VMS operating system.

The system was designed as a general purpose computer targeted at OEMs and multiple-unit end users.

A typical price is $70,000, although quantity and other discounts apply.

First Computer Corp. is located at 645 Blackhawk Drive, Westmont, Ill. 60559.

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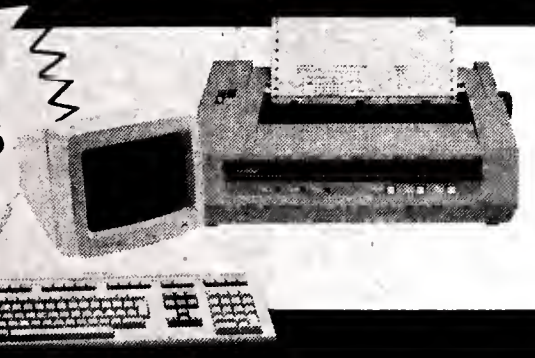

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SYSTEMS & PERIPHERALS

Firm offers dual-function workstation

HORSHAM, Pa. — Decision Data Computer Corp. has announced a dual-function workstation designed for use with IBM System/34, System/36 and System/38 processors.

The DDCC-01 workstation is reportedly compatible with the IBM Personal Computer for local applications processing and the IBM 5250 family of terminals. That compatibility is intended to provide the workstation with the flexibility to act as a free-standing personal computer capable of running IBM Personal Computer software plus the ability to access mainframe applications and data bases on the System/34, System/36 and System/38.

Standard software is said to include advanced-function Basic and Microsoft, Inc.'s MS-DOS operating system.

The workstation includes an Intel Corp. 8088 microprocessor, 128K bytes of random-access memory (expandable to 640K bytes), two 5¼-in. diskette drives with 360K bytes of storage each and a monochrome monitor. Four expansion slots are available for additional boards, according to the vendor.

According to the company, a hot key sequence allows the operator to switch between computing and terminal emulation functions, while the adjustable, low-profile, 83-pad keyboard has dual legends for supporting the separate operations.

Deliveries are scheduled for April or May. The workstation is priced at $3,184, and the emulation software is priced at $893.

Decision Data Computer is located at 100 Witmer Road, Horsham, Pa. 19044.

Ford Higgins introduces general-purpose mini

BOULDER, Colo. — Ford Higgins Ltd. has announced the Powerframe Model 2340, a general-purpose minicomputer designed for multitasking, multiuser environments.

The 2340 is based on the Digital Equipment Corp. PDP-11/23 Plus processor and can use DEC's RSTS, RT-11 and RSX operating systems. Features include an 8-in., fixed/removable, 40M-byte rigid disk drive, 256K bytes of random-access memory, dual ports and an expandable system pedestal cabinet. The cabinet contains a slide-out wire cage providing internal access to exchange logic or memory boards and storage subsystems.

The chassis has slots for expanding memory to 4M bytes and allows the addition of an expansion module.

The company's Powerdrive disk storage subsystem features 20M bytes of storage on fixed media and 20M bytes on a removable cartridge, the vendor said.

According to Ford Higgins, the 2340 is practical for up to 12 concurrent users.

The company said that future 16-bit and 32-bit systems based on DEC, Motorola, Inc. and National Semiconductor Corp. processors may be added onto the 2340.

The company reported that the Powerframe series is intended for sale primarily to OEMs and to large-quantity end users.

Available now, the Powerframe 2340 is priced at $13,990.

Ford Higgins is located at 4755 Walnut St., Boulder, Colo. 80301.

TURNKEY SYSTEMS

OMNILOGIC, INC.
Personal Banker System 1000

Omnilogic, Inc. has announced its Personal Banker System 1000, a group of at least 1,000 home banking terminals linked by phone lines to a minicomputer, which reportedly provides a full range of electronic home banking services.

The terminals reportedly provide displays and printed copies of transactions and communicate with their host, a Plexus Computers, Inc. P/60 minicomputer, using a proprietary method said to provide a level of security. The host computer is included as part of the system and is operated by the bank.

The system can reportedly be upgraded to support many terminals, each of which is only on-line with the processor at the beginning and end of a banking session. Most of each transaction's processing is done off-line. When the transaction is finished, the terminal sends the information to the system's computer and prints a numbered receipt.

Each terminal weighs about a pound and operates as a clock when not in use, displaying the time on its two-line LCD screen.

The Personal Banker System 1000, with 1,000 home banking terminals and a fully programmed CPU, is priced at $445,000. Additional terminals are $165 each, in lots of 1,000.

Omnilogic, Suite 1100, 401 Wilshire Blvd., Santa Monica, Calif. 90401.

See **SYSTEM** page 70

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David Jamison Carlyle recommends the Diablo 630 Series.

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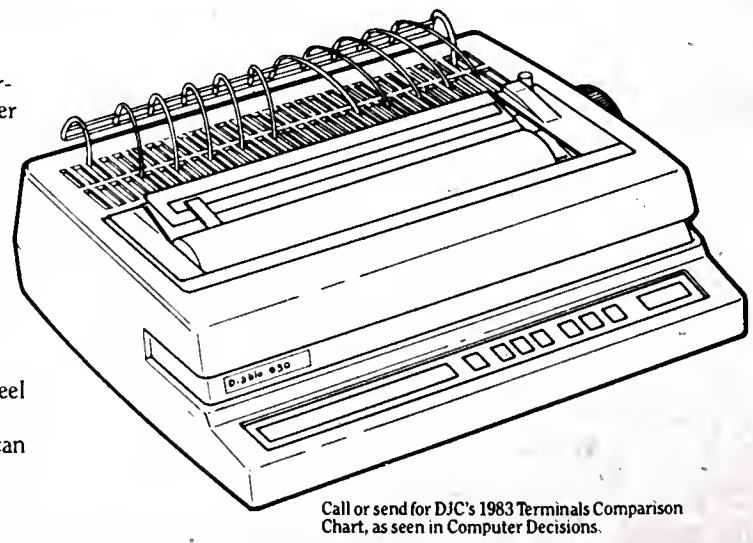

Call or send for DJC's 1983 Terminals Comparison Chart, as seen in Computer Decisions.

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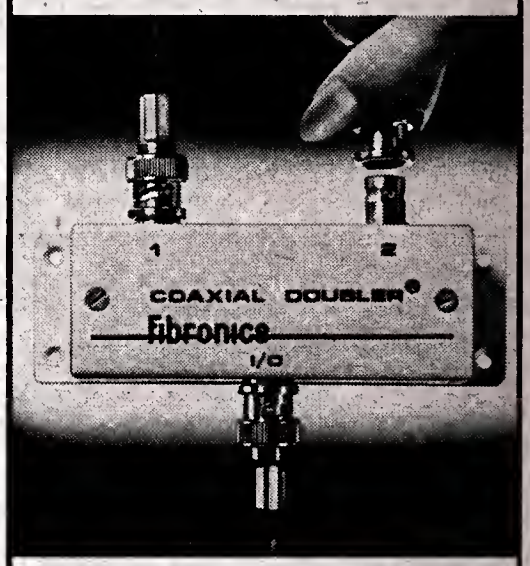

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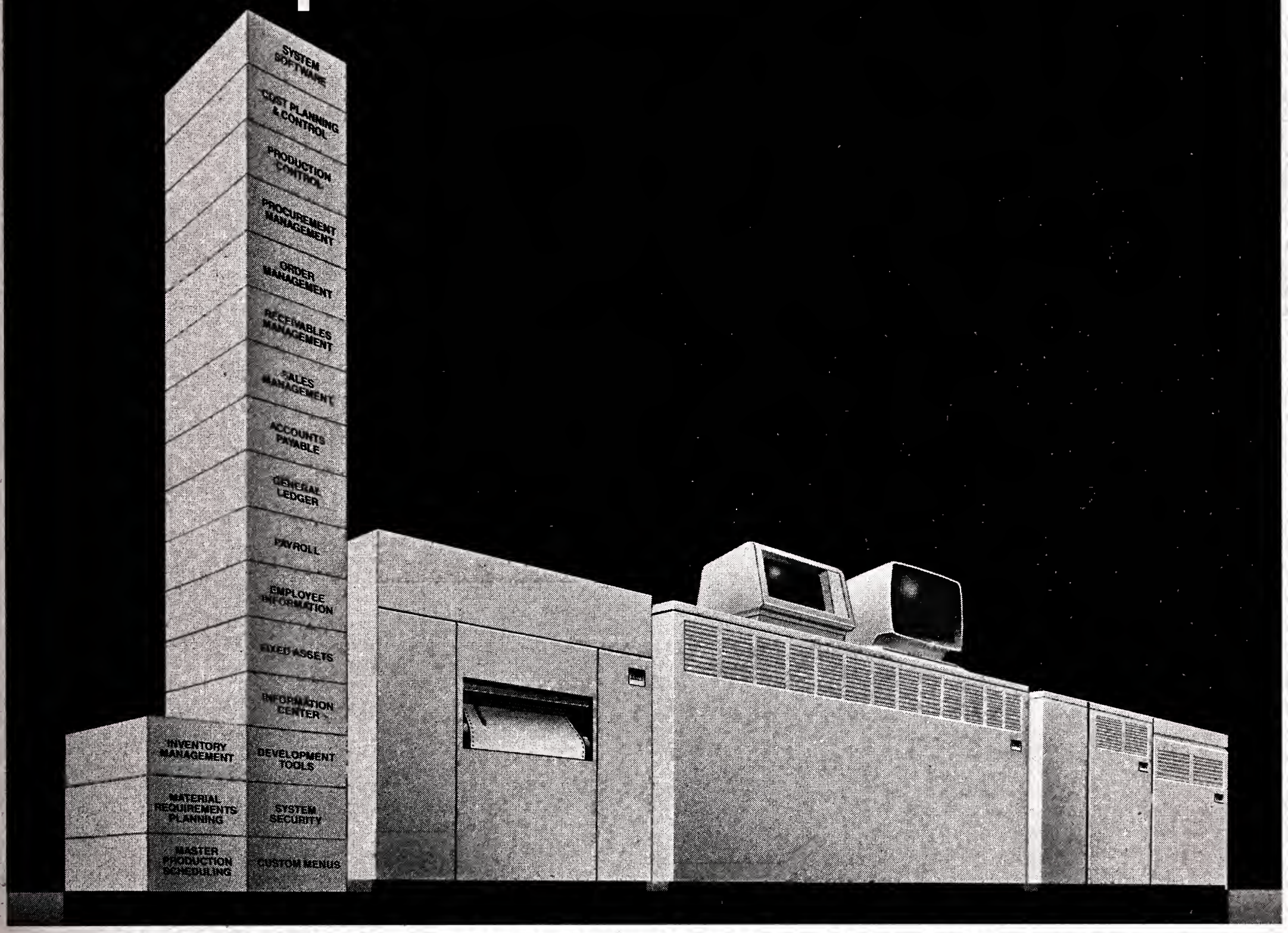

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SYSTEM from page 66

SANCHEZ COMPUTER ASSOCIATES, INC.
Profile

Sanchez Computer Associates, Inc. has announced a line of turnkey minicomputer systems said to be designed for commercial banks and thrift institutions with assets of up to $1 billion.

The bundled Profile system hardware and software packages reportedly utilize Digital Equipment Corp. PDP-11 or VAX-11 series processors and are said to offer transaction modules covering every type of banking activity.

A deposit processing module features subsystems for statement and passbook savings, certificates of deposit, Individual Retirement Accounts and NOW accounts, according to a vendor spokeswoman.

The spokeswoman said the transaction modules interact as a comprehensive Customer Information File and can interface with the bank's general ledger.

The systems reportedly give banks the ability to perform profit analyses by customer and target marketing programs based on user-set parameters.

Profile II utilizes a DEC PDP-11/23 mini; Profile III, a PDP-11/44; Profile IV, a VAX-11/750; and Profile V, a VAX-11/780 mini, the vendor said.

The systems are available now and are priced between $75,000 and $1.5 million, the spokeswoman said.

Sanchez Computer Associates, Phoenixville Pike and Charlestown Road, Malvern, Pa. 19355.

PROCESSORS

MERCURY COMPUTER SYSTEMS, INC.
Zip 3200 Series

Mercury Computer Systems, Inc. has announced a line of software-programmable, array processors for microcomputer-based systems.

The Zip 3200 Series was designed for applications in image, signal, graphics and scientific processing. It is based on dual processor data flow architectures and offers a choice of pipelined arithmetic processors. According to the company, it is offered for sale to OEMs.

The company said that its Zip 3216, available on a 30-day lead time, performs 16-bit (block floating point) arithmetic at 20 million computations per second and 32-bit arithmetic at five million computations per second. Its primary target is image and signal processing applications.

The Zip 3232, scheduled for delivery in the fourth quarter of 1984, performs 32-bit (floating point) arithmetic at 10 million calculations per second, according to the company. Its primary targets are graphics and scientific applications.

Both processors operate concurrently with a 10 million instructions per second control processor and an internal 40M byte/sec bus which connects all system components.

In their base configurations, the products consist of a three-board multibus card set with the pipeline on one card. Basic main memory is 128K bytes, with memory expansion available in 512K-byte increments up to 16M bytes, the company said.

The Zip 3216 is priced at $8,000, while the Zip 3232 is expected to be priced at $10,000. OEM discounts are available.

Mercury Computer Systems, 600 Suffolk St., Lowell, Mass. 01854.

DATA STORAGE

BERING INDUSTRIES, INC.
Eight disk drives; Option 660

Bering Industries, Inc. has announced eight additions to its Series 3000 Winchester disk drive family. The firm also announced a firmware enhancement that allows file-sharing among two or three Hewlett-Packard Co. computers.

The eight disk drive models provide 20 basic configurations and feature capacities ranging from 5M bytes to 30M bytes. They may include built-in 3½-in., 5¼-in. or 8-in. floppy disk drives. Each subsystem includes an integral power supply and controller and features an average transfer rate of 174K byte/sec.

Delivery is within 30 days.

The models include the Model 3000, ranging in price from $2,540 for 5M bytes to $4,680 for 30M bytes; Model 3300, including a 3½-in. floppy drive, ranging in price from $2,840 to $4,980; Model 3500, including a 5¼-in. floppy drive, costing from $3,250 to $5,890; and Model 3800, with an 8-in. floppy drive, ranging from $4,260 to $6,900.

The firmware enhancement, Option 660, resides in the Series 3000 disk controller and arbitrates the use of a common data storage area in the hard disk. Each computer requests access to that area through its own port. The option is intended to allow file-sharing in applications that don't require a full-scale local-area network.

The firmware is said to offer three sizes of shared information space — 1.2M bytes, 4.9M bytes and 9.8M bytes — and to allow each computer to access the space via software control.

According to Bering, the firmware is compatible with all HP technical and personal computers. Option 660 is available on new Series 3000 models and for factory upgrades for the installed base.

Option 660 is priced at $480 including a software utility. A two-port option costs $700, and a three-port option costs $850.

Bering, 1400 Fulton Place, Fremont, Calif. 94539.

DATA SYSTEMS DESIGN
Stacpac

Data Systems Design has announced Stacpac, a tape subsystem for Digital Equipment Corp.'s PDP-11 and other systems which use DEC's Q bus.

Stacpac, a ¼-in. tape system, emulates DEC's TSV05/TS-11 subsystems, employs a true stop and start tape and permits use of backup commands such as BRU, PIP and SAVRES, the vendor said. The unit includes power-on confidence tests to confirm drive-to-controller connec-

Continued on page 72

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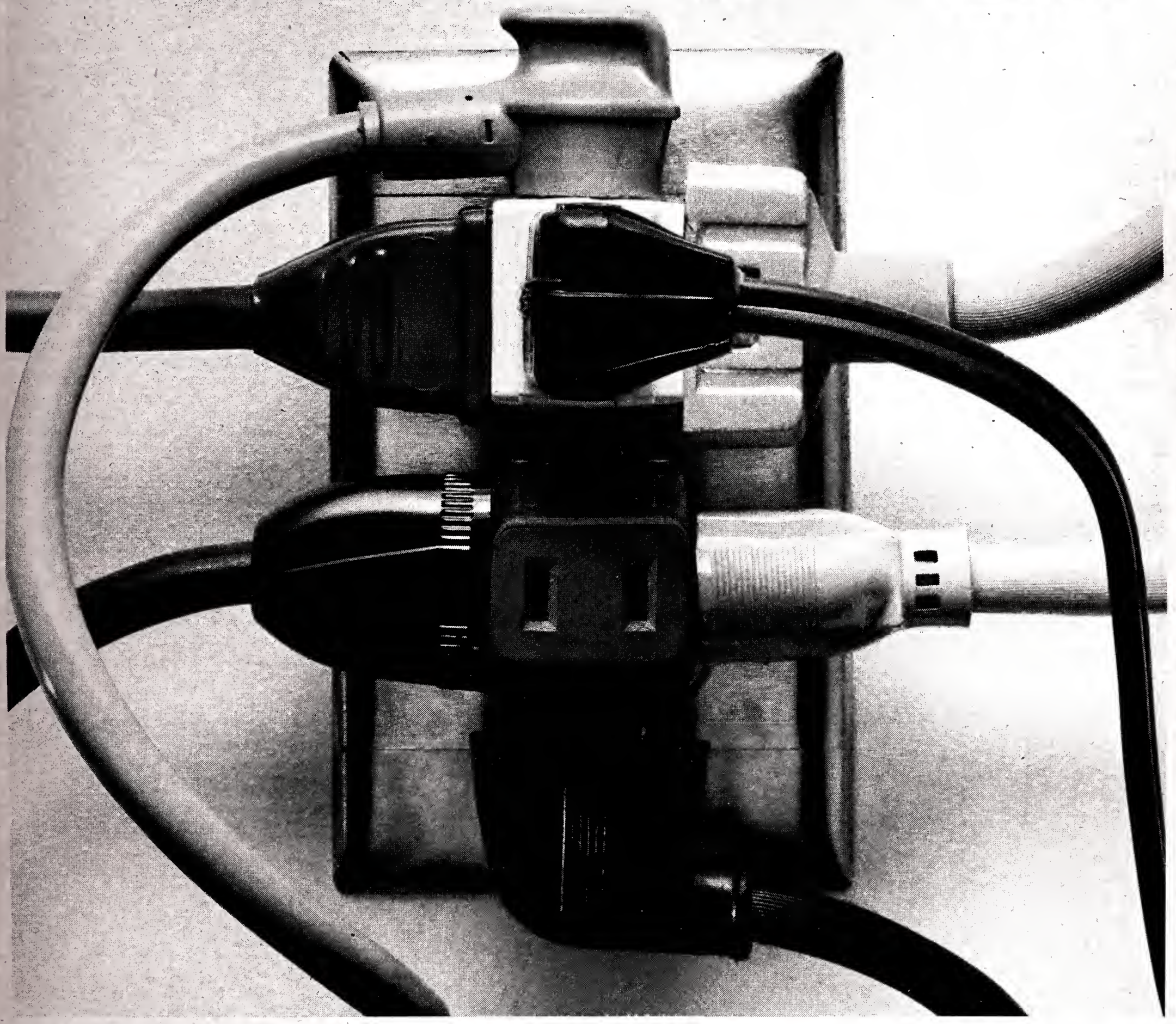

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SYSTEMS & PERIPHERALS

Continued from page 70

tions and to test internal controller logic, according to the vendor. Online diagnostic tests check test controller read and write circuitry and last error code and microcode version number displays, the vendor said.

Stacpac costs $3,495.

Data Systems Design, 2241 Lundy Ave., San Jose, Calif. 95131.

COMPUTER AUTOMATION, INC.
Streaming tape subsystem

Computer Automation, Inc. has introduced an 8-in. streaming tape subsystem designed for system file backup and archive storage for fixed Winchester and removable media disk drives.

The subsystem, which reportedly can back up 45M bytes of formatted data on one cartridge, uses Ansi-standard ¼-in. tape and permits the interchange of data between user sites. The subsystem is also said to eliminate the need to update individual records by incorporating very short interrecord gaps with constant tape motion.

The subsystem is priced at $3,395, with quantity discounts available, the vendor said.

Computer Automation, Naked Mini Division, 18651 Von Karman, Irvine, Calif. 92713.

MICRO TECHNOLOGY, INC.
MSV05

Micro Technology, Inc. has introduced a streaming tape controller for use with the Digital Equipment Corp. Q-bus. The unit reportedly provides up to 45M bytes of backup capacity in less than nine minutes.

The controller, the MSV05, is a single board said to contain all the circuitry needed to emulate DEC's TSV05 subsystem. The MSV05 interfaces with cartridge drives from Archive Corp., Cipher Data Products, Inc. and Tandberg Data Storage, Inc. It is also said to include block-mode direct memory access and the ability to support multiple drives.

The controller is priced at $1,425, with quantity discounts available.

Micro Technology, 1620 Miraloma Ave., Placentia, Calif. 92670.

MICRO TECHNOLOGY, INC.
MX22 floppy disk controller

Micro Technology, Inc. has introduced a controller for floppy disk drives running on Digital Equipment Corp. Unibus computers, particularly DEC's VAX-11/730 superminicomputer.

The product reportedly permits users to add additional floppy disk drives beyond those, if any, provided by the manufacturer.

The controller, the MX22, is a quad-size board which can reportedly emulate up to four DEC RX02 floppy disk drive subsystems. Users are able to interface either four 8-in. drives, four 5¼-in. drives or two of each. To interface with the DEC PDP-11 series minicomputers, the MX22 requires a single Unibus slot.

The MX22 also features self-diagnostics and on-board bootstrap and power-fail protection. A built-in LED indicates fault status. The MX22 costs $1,045, with quantity discounts available.

Micro Technology, 1620 Miraloma Ave., Placentia, Calif. 92670.

TERMINALS

APPLIED DIGITAL DATA SYSTEMS, INC.
M1000

The M1000, an IBM Personal Computer-compatible workstation for the Mentor system business computer family, has been announced by Applied Digital Data Systems, Inc. (Adds).

The M1000 workstation is designed for use in conjunction with a host Mentor system. It is said to allow users to extract specific data from Mentor host data bases in a Microsoft, Inc. MS-DOS-compatible format. Data can then be used in an MS-DOS application, and refined data can be returned to the host in a form compatible with the Mentor operating systems, Adds said.

It enables users to utilize such MS-DOS applications as spreadsheets, word processing and graphing, the company noted, and allows them to integrate those programs under the control of the Adds-enhanced Pick & Associates, Inc. Pick operating system of the host Mentor.

Base price for the M1000 workstation for the Mentor is $2,695, including 128K bytes of random-access memory (expandable to 768K), one 360K-byte diskette (expandable to two diskettes), a 12-in. monochrome display, keyboard and software. The MS-DOS-compatible software is bundled into the price of the M1000 and is also available separately priced to Mentor users.

Applied Digital Data Systems, 100 Marcus Blvd., Hauppauge, N.Y. 11788.

SYSTEMS, TERMINALS AND COMMUNICATIONS CORP.
The Wang Compatible Terminal Workstation

Systems, Terminals and Communications Corp. has announced a series of terminals designed for use in the federal and general marketplace with Wang Laboratories, Inc. computers.

The Wang Compatible Terminal Workstation is based on the Applied Computer Sciences, Inc. ACS 5000 and is compatible with all Wang systems, the vendor said.

Features are said to include an optional amber screen, alpha-lock key, an execute key positioned further away from the delete key than on Wang terminals and a detachable keyboard. Available now, the 10 models cost from $2,100 to $2,500.

Systems, Terminals and Communications, 1101 Vermont Ave. N.W., Washington, D.C. 20005.

See **TERMINALS** page 74

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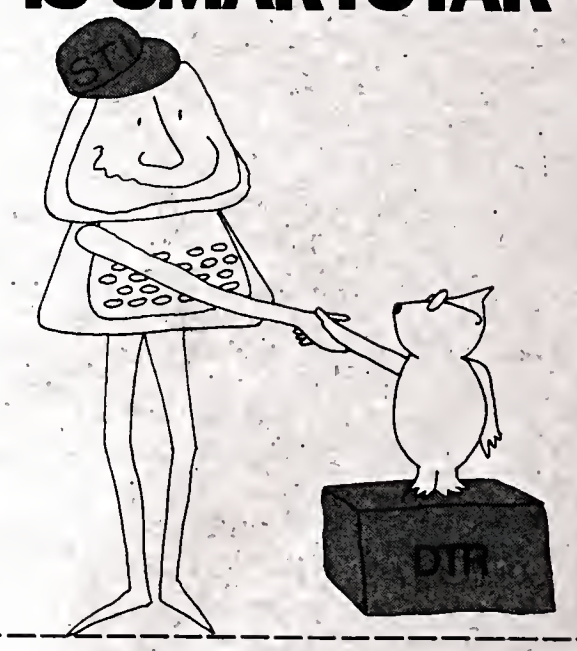

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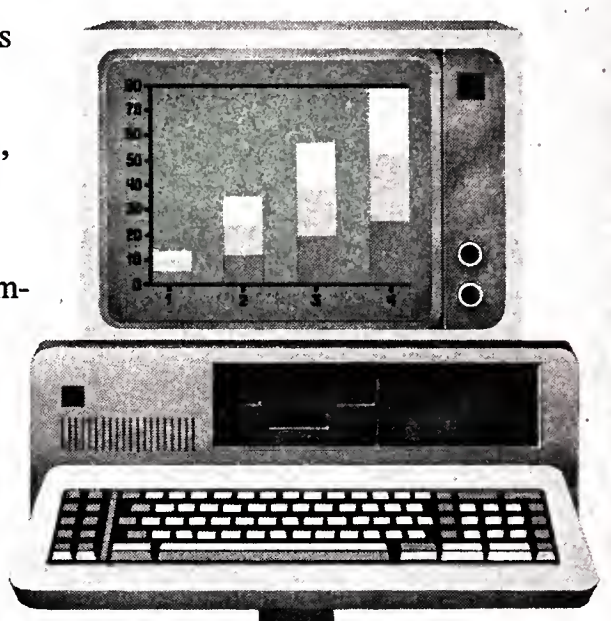

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SYSTEMS & PERIPHERALS

TERMINALS from page 72

CPT CORP.
8530; 8535

CPT Corp. has added two multifunctional workstations with increased memory capabilities to its 8500 series systems.

The 8530 and 8535 workstations are said to offer 224K bytes of random-access memory, black-and-white monitors, 88- to 96-char. keyboards and the vendor's operating system and software. The 8530 comes with an 8-in., single-sided, double-density disk drive. The 8535 includes an additional 315K-byte drive.

The workstations reportedly are compatible with the vendor's nonintegrated shared resource system (SRS45) and, when combined with the vendor's Interactive Display Emulator, can run concurrent CPT text processing and terminal emulation data processing to a host mainframe. Data processing is also available through the vendor's Compupak interface to Digital Research, Inc.'s CP/M operating system.

Prices for the 8530 and 8535 start at $5,000.

CPT, 8100 Mitchell Road, P.O. Box 295, Minneapolis, Minn. 55440.

PRINTERS/PLOTTERS

TELEVIDEO SYSTEMS, INC.
TP 750

Televideo Systems, Inc. has released a letter-quality, daisywheel printer for office use with micros, minis and word processors.

The TP 750 is said to run at 50 cycle/sec with a mean time between failures of over 5,000 hours. It has a standard Centronics Data Computer Corp. parallel interface and an optional serial interface and includes a bidirectional forms tractor.

The TP 750 offers 132 col. at 10 pitch and features pitch positions of 10, 12 or 15 with proportional spacing. It handles up to 271 char. and paper up to 15 in. wide. It features automatic bidirectional printing and automatic centering and justification. It is available now for $1,595. The serial card is priced at $99, the tractor feed at $275.

Televideo Systems, 1170 Morse Ave., Sunnyvale, Calif. 94086.

HOUSTON INSTRUMENTS
DMP-29R

Houston Instruments has announced a flatbed plotter for Digital Equipment Corp. systems using DEC's Regis graphics language.

The DMP-29R is an eight-pen, flatbed, Regis-intelligent plotter using 8½- by 11-in. or 11- by 17-in. media. According to the company, it features a .001-in. addressable resolution.

The DMP-29R is said to emulate DEC VT125 graphics terminals. Performance features reportedly include the ability to define window limits, scale plots up or down as required, vary line intensity, evoke European character sets and automatically describe circles, ellipses and general curves.

Available now, it is priced at $2,295.

Houston Instruments, 8500 Cameron Road, Austin, Texas 78753.

BOARD-LEVEL DEVICES

KONTRON ELECTRONICS
RAM expansion option

Kontron Electronics has announced a 2K bit/channel random-access memory (RAM) expansion option for its logic analyzers. It is said to double the amount of memory available to collect data for analysis.

The option lets users be less specific about data they want to capture and collect a whole operation of subroutines rather than pieces.

The Kontron logic analyzers feature 32, 48 or 64 channels allowing 16-bit or 32-bit microprocessors to be analyzed. The RAM option is priced at $2,000 for 32 channels, $2,500 for 48 channels and $3,000 for 64 channels. It is available immediately.

Kontron Electronics, 630 Price Ave., Redwood City, Calif. 94063.

Peritek Corp.
HEX-Q

Peritek Corp. has introduced HEX-Q, which links six Digital Equipment Corp. PDP-11 minicomputers in a distributed processing system.

The unit provides up to 28M bytes of random-access memory with transfer rates exceeding 125,000 16-bit words per second. HEX-Q has dual-height direct memory access cards in each computer and dual-height hexadecimal (HEX) and interprocessor board (IPB) cards in the host. The HEX and IPB cards serve as the switch that hooks one of the six satellite computers to the host. Prices range from $1,600 to $4,500.

Peritek, 5550 Redwood Road, Oakland, Calif. 94619.

K-SYSTEMS, INC.
KTL-100

K-Systems, Inc. has announced a printed circuit module that reportedly emulates Digital Equipment Corp. VT100 CRT terminals.

The KTL-100 dual-height board is provides full-duplex serial asynchronous channels for keyboard and computer interface and an RS170 composite video output for a monitor.

Installed in a standard DEC backplane or equivalent power source, it implements the Advanced Video Option, including 80/132 columns, non-

Continued on page 76

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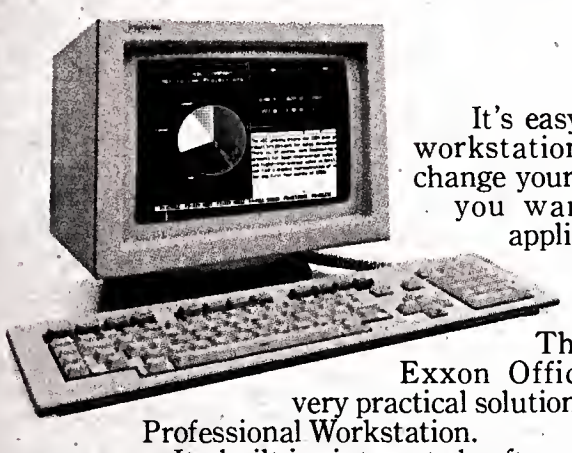

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SYSTEMS & PERIPHERALS

Continued from page 74

volatile setup parameters and display. It costs $600.

K-Systems, 3902 Lilac, Las Cruces, N.M. 88005.

AUXILIARY EQUIPMENT

PRO-LOG CORP.
RAM option

Pro-Log Corp. has announced a 64K-byte random-access memory buffer option for its M980 and M910A programmable read-only memory programmer control units.

Existing M980 and M910A control units reportedly can be upgraded to the 64K-byte option.

With the buffer option, the M980-64 is priced at $2,750.

Pro-Log, 2411 Garden Road, Monterey, Calif. 93940.

PERKIN-ELMER CORP.
DAQ/7000

Perkin-Elmer Corp. has announced the DAQ/7000 digital and analog interface for the company's Series 7000 Professional Computer. It allows users to acquire data and output control to devices in the laboratory.

The product is a remote intelligent interface which communicates with the computer over the IEEE-488 bus. The interfacing library in the package was designed to be used from either Basic or Fortran, and the library serves as the interface between a high-level language and the hardware.

Functions supported by the interface are I/O of analog signals, I/O of binary coded decimal, I/O of 8-bit parallel ports and of individual bits. It costs $3,995.

PE, Main Ave., Norwalk, Conn. 06856.

MERIT SYSTEMS
RS-232 Cable Tester

An RS-232 Cable Tester was recently announced by Merit Systems. The unit was designed to check RS-232C cables for broken or shorted wires without removing cables from under a floor or bringing both ends together.

According to the company, depressing a single rocker switch to either the "open" or "short" test mode displays the status of all 25 conductors on a 25-LED display.

The Cable Tester consists of a base and a turnaround which fit together for storage. Both the base, with mode switch and display, and turnaround have DB25 male and female conductors.

The unit costs $250.

Merit Systems, P.O. Box 905, Norwalk, Conn. 06856.

DISK from page 65

method, which IDC said optical disk manufacturers are touting as the best technique in an erasable environment, is the phase-change method. This procedure uses a laser to alter the condition of the disk platter's coating from an amorphous to a crystalline state. The two states can then be translated into digital ones and zeros, the report said. The advantage is the states can be altered by the user.

Perhaps the most obvious use for optical storage products is for archival storage — the type of storage many firms are now using micrographics to accomplish. The report noted the current industry trend is to incorporate micrographics, such as microfilm and microfiche, into other areas of data processing, such as office automation, word processing and electronic mail.

The report concluded that optical storage techniques will probably start to replace micrographics in the early 1990s, with initial units offering a combination of micrographics and optical recording capabilities. But the report was quick to add that micrographics will probably never become extinct.

IDC contended that micrographics will probably remain a strong contender in the archival storage marketplace because its reliability has been proven, it is relatively inexpensive and it is convenient. The report also noted the archival life of micrographics is up to 10 years. While makers of optical disk drives contend optical disks will last at least as long as micrographics, IDC noted those claims have yet to be proven.

The IDC report is called "Storage Alternatives for the '80s" and costs $1,500 from the firm, which is located at 5 Speen St., Framingham, Mass. 01701.

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3B2

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It is a 32-bit super microcomputer running UNIX System V. But it has the power of a min computer.

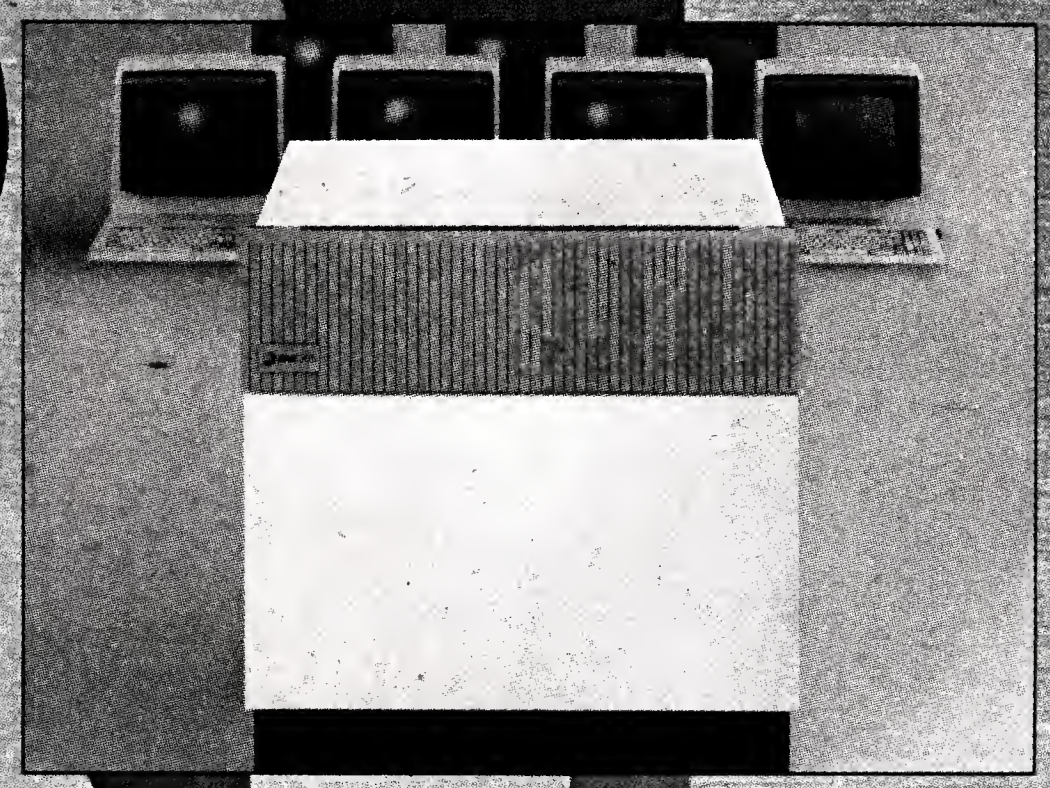
It incorporates 256K DRAM chips for high-capacity main memory of up to 2 megabytes. So more is delivered than with the average micro-computer, and at a lower cost per station.

It's the 3B2/300. From AT&T.

Perfectly targeted for an office where several people need a desk-top computer, and there's a need to accommodate growth. And it can function as an intelligent network host or file server for PCs.

And the 3B2/300 is available in a variety of solutions packages with flexible growth options.

It is the most advanced super microcomputer your customers can buy today.



3B5

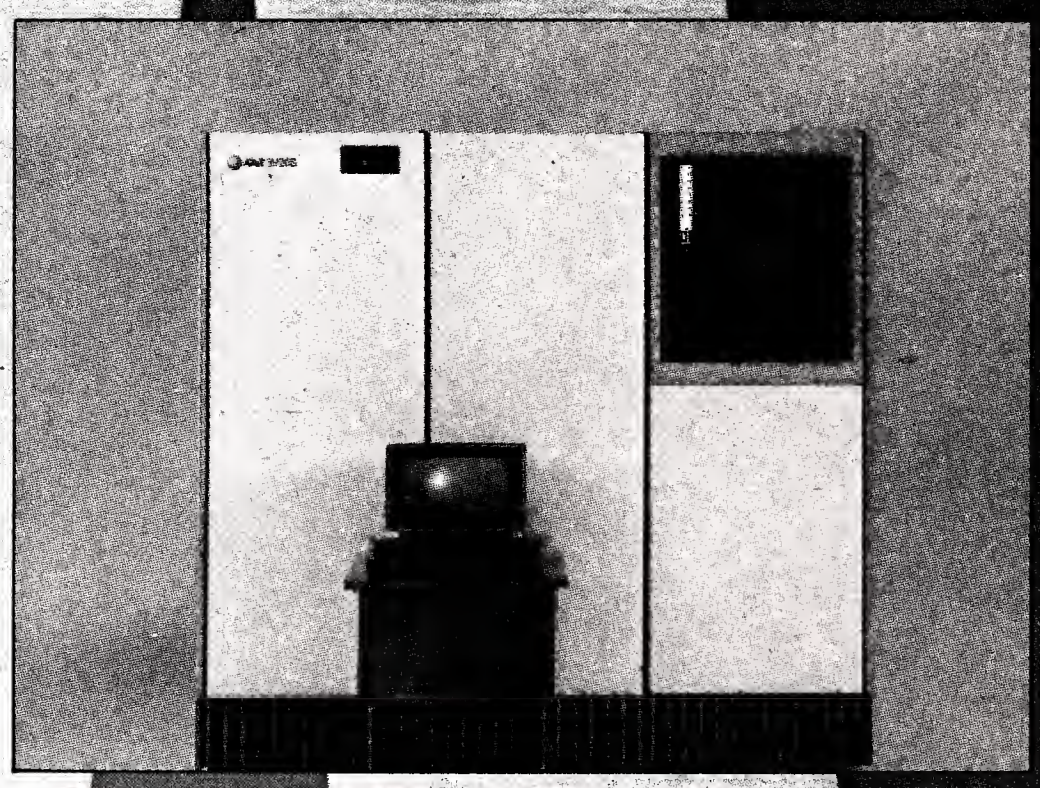
These general-purpose, midrange, true 32-bit, super minicomputers are designed to run UNIX System V and can accommodate up to sixty users without putting a dent in response time.

They are remarkably easy to use, and easy to maintain because they are self-diagnostic. They are flexible, powerful tools for a variety of applications, such as software development, office systems, and CAD/CAM.

They're the 3B5/100 and 3B5/200. From AT&T.

They can be configured to suit customer needs with a wide variety of I/O, peripheral, memory, and communications options for cost-effective growth. This makes them good investments for your customers.

These computers fit neatly into the office environment. And are incredibly quiet, cool, efficient, and plug into standard wall outlets.



3B20S

The 3B20S computer is the high-end sup[illegible]rmini of the 3B family. It runs UNIX System V and [illegible]s designed to meet the rigorous needs of data centers, developers, office service organizations, and manufacturing locations.

When a customer outgrows these capabilities, you simply add the attached processor forming the 3B20A. And add up to 80% to your performance range. Or you can begin serving your needs with the 3B20A right from the start.

And the growth from the 3B20S to the 3B20A occurs as painlessly as possible with only a modest increase in cost.

Both computers are energy efficient and easy to install. They perform without complex and expensive environmental controls. And unlike most computers of this capacity, the 3B20S and the 3B20A do not require air conditioning or raised floors.

3B20D

It is a powerful, 32-bit super minicomputer that will set a new standard for uptime. It runs the new UNIX RTR operating system, providing time-sharing and introducing real time and fault-tolerant features.

It operates continuously even during hardware faults, data-base mutilations, repair, software updates and growth.

It is the 3B20D. From AT&T.

It is ideal for applications requiring ultra-reliability and fast response such as reservation systems, command and control systems, on-line banking systems, and others where computer outage means serious or intolerable business losses.

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For continuous computing, the 3B20D is unsurpassed in its class.

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MICROCOMPUTERS

SMALL TALK
Eric Bender
CW Senior Editor

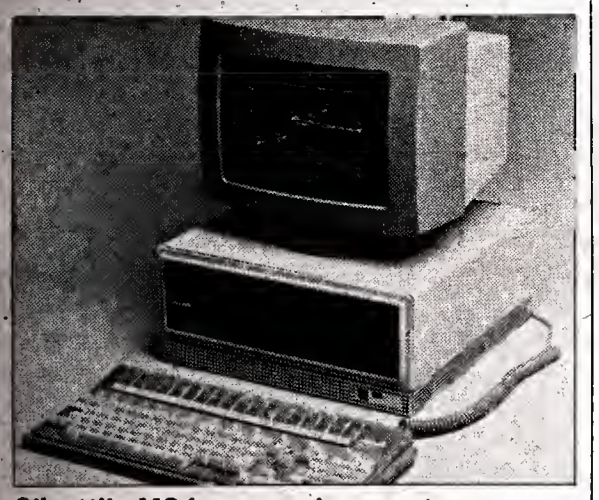
Olivetti's micros draw attention

The two Olivetti Corp. micros shown here were standouts among the IBM Personal Computer-compatible micros displayed at this month's Hannover Trade Fair. The machines drew special attention because of their potential as OEM products for AT&T, which plans to buy 25% of Olivetti. The Italian manufacturer acknowledged that talks with AT&T about supplying one or both machines have taken place, although no deal has been announced.

Olivetti's new M24 is built around an Intel Corp. 8086 chip, with a socket for an optional 8087 coprocessor. The system features 128K bytes of random-access memory, expandable to 640K bytes, Olivetti said. The M24 includes either one or two minifloppy drives, with either 360K or 720K bytes each, or one floppy and a 10M-byte hard disk.

The M24 supports Microsoft, Inc.'s MS-DOS, Digital Research, Inc.'s Concurrent CP/M 86, the UCSD P-system and Olivetti's proprietary Pcos operating systems. A 12-in., high-resolution display (monochrome or color), serial port and parallel port are standard. Options include up to seven expansion slots, Ethernet or Corvus Systems, Inc.'s Omninet local-area network boards and a Zilog,

See **OLIVETTI** page 89



Olivetti's M24 personal computer

Olivetti's M21 transportable micro

CDC offers micro maintenance

Promises fast service for IBM Personal Computers

By Paul Korzeniowski
CW Staff

MINNETONKA, Minn. — Control Data Corp. has entered the microcomputer service business with Backup, a maintenance program for IBM Personal Computers and Personal Computer XTs, said to replace defective equipment within four hours of a call.

"IBM Personal Computer users are professionals who do not want pieces of the machine spread across their desk," said Daryl Olsen, CDC's marketing manager for microcomputer services. "They want a new machine, so we supply it and take the defective machine to our service office for repairs."

"Sixty percent of IBM Personal Computer users do not have a service policy," Olsen said. "We see service as a huge untapped market." Service contracts can simplify logistics at large corporations, which do not have to stock replacement Personal Computers or implement corporate service policies, he claimed.

CDC currently has 14 service centers in major metropolitan areas and plans to expand to 40 centers by year's end, Olsen said. The four-hour service is available only to customers within 50 miles of a center. For other areas, CDC offers 24-hour exchange service. "We will ship the user a new system as soon as we receive a defective one."

Backup is available in two pricing structures: fixed fee or flexible fee. Fixed-fee pricing costs $545 a year; an annual flexible fee costs a minimum of $204 and a maximum of $675. Large users will receive volume discounts.

Backup services IBM microcomputers and selected peripherals from companies such as Amdek Corp.; Corona Data Systems, Inc.; Corvus Systems, Inc.; Davong Systems, Inc.; Epson America, Inc.; NEC America, Inc.; and Qume Corp. "We can't service every machine on the market, but we do support popular products," Olsen said.

CDC plans to expand its service line. "The 3270 Personal Computer will probably be the next item added to the service plan," Olsen predicted. "When the IBM Portable [Personal] Computer and PCjr reach volume shipments, they may also be added."

CDC is located at 5720 Smetana Drive, Minnetonka, Minn. 55343.

Eagle 1600 replacement debuts

LOS GATOS, Calif. — Eagle Computer, Inc. has replaced its high-end IBM Personal Computer-compatible Eagle 1600 with the new Eagle Turbo XL, which the company said offers a lower price, dual processing speeds and the ability to act as a network file server.

Eagle claims that the Turbo XL runs IBM Personal Computer software including Lotus Development Corp.'s Lotus 1-2-3 and Microsoft, Inc.'s Flight Simulator. "Since we use a faster processor, programs will run two times faster on our machine than on the IBM Personal Computer," said Ronald Petersen, vice-president of product planning. "Turbo XL is designed for users requiring a high-performance microcomputer."

Turbo XL is based on an Intel Corp. 8086 microprocessor and costs $4,995 without a monitor. The system features 256K bytes of random-access memory (expandable to 512K bytes), five expansion slots, a 10M-byte hard disk drive and a toggle switch that allows the user to switch from 8-MHz to 4.77-MHz processing speeds, Petersen said. "Users may want to slow the machine for scrolling or game playing," he noted.

The microcomputer can act as a network file server for Eaglenet (the company's local-area network, based on a Nestar Systems, Inc. implementation of Datapoint Corp.'s Arcnet), connecting up to 10 Eagle microcomputers. A network starter kit is priced at $1,995, and each microcomputer adapter costs $695.

See **EAGLE** page 89

Food wholesalers reduce costs using micros, time-sharing network

By Robert Batt
CW West Coast Bureau

CHICAGO — In an attempt to slash transportation costs, the National-American Wholesale Grocers Association (Nawga), is sponsoring a two-month computer pilot project here that will coordinate distribution activities for some of the nation's leading food wholesalers.

Using IBM Personal Computers connected to the General Electric Co. Mark III telecommunications time-sharing network, Nawga has set up its Backhaul Clearinghouse system linking 28 food distributors in the Midwest. Cities covered by the network include Chicago, Milwaukee and Minneapolis.

The wholesalers will use the Personal Computers to update their distribution schedules on the network, advertise their transportation needs or availability and coordinate their distribution much more effectively, Nawga claimed.

Dealing with empty trucks

Food distributors often send out empty trucks to pick up commodities located hundreds of miles away, according to Richard Coyne, Nawga's director of task force services. On many occasions, he asserted, the cargo is a fraction of the truck's holding capacity, further adding to the waste of time, manpower and equipment.

One frozen foods distributor, whose 20 trucks pick up goods from 35 suppliers and service 3,000 customers, will save some $4,000 a week by joining the Backhaul network and sharing its resources, Nawga estimated.

See **TRUCKS** page 89

INSIDE

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MICROCOMPUTERS

Shugart announces minifloppy

SUNNYVALE, Calif. — Shugart Associates, Inc. has introduced a 5¼-in. minifloppy said to offer the same performance and recording capabilities as the company's 8-in. disk drives.

The new Shugart 475 features a double-sided drive with 1.6M bytes of storage, a data transfer rate of 500K bit/sec, a track-to-track access time of 3 msec, 96 track/in. density and the ability to read data written on media of 48 track/in., the vendor said.

The minifloppy uses the same recording format as standard 8-in. floppy disk drives and runs on a standard 8-in. floppy disk drive controller, Shugart said.

The 475's printed-circuit board includes large-scale integration circuitry and a 4-bit microprocessor to handle the read channel, write channel and motor control electronics, the vendor said. The read/write head is positioned with a stepper motor/band actuator system, and a vertical clamping mechanism helps reduce positioning errors, according to Shugart.

The 475 costs approximately $200 in OEM quantities.

More information is available from Shugart, which is located at 475 Oakmead Pkwy., Sunnyvale, Calif. 94086.

SYSTEMS

CHALLENGE SYSTEMS, INC.
Translating Word Processor

Challenge Systems, Inc. has announced the Translating Word Processor, a desktop computer designed for Spanish/English translation.

Some of the product features include: automatic bidirectional translation; multilingual text editing; a 25,000-word general dictionary in both languages, which includes idioms and expressions; and automatic backup storage on a removable cartridge, according to a company spokesman.

The central processing component contains dual Zilog, Inc. Z80 microprocessors with 384K bytes of main storage. It is packaged with a built-in, battery-backed clock and a 1M-byte, 8-in. floppy disk drive.

Its price is $25,000.

Challenge Systems, 1299 Commerce Drive, Richardson, Texas 75081.

LINKDATA, INC.
IBM System 9000 with Dibol capability

Linkdata, Inc. has introduced a multiuser IBM System 9000 microcomputer system that reportedly can use Digital Equipment Corp.'s Dibol business application software.

The vendor's UNI-DOS operating system is said to allow the IBM System 9000 microcomputer to run all Dibol software. The vendor's programming language is source-to-source-compatible with Dibol, and UNI-DOS emulates DEC's CTS-300 and CTS-500 operating systems, according to a vendor spokesman.

A basic configuration, priced at $16,900, consists of a CPU, one CRT terminal with three expansion ports, a 25M-byte Winchester disk drive (with 5M bytes removable and 20M bytes fixed) and 256K bytes of memory.

Linkdata, 2005 Rt. 22, Union, N.J. 07083.

SCIENTIFIC MICRO SYSTEMS, INC.
SMS 1000 Model 40

Scientific Micro Systems, Inc. (SMS) has introduced a microcomputer system that reportedly is fully compatible with Digital Equipment Corp. systems.

The SMS 1000 Model 40 will run, without modification, all system and application software developed for DEC's LSI-11/23 and LSI-11/73 CPUs, according to the vendor.

The Model 40 is a Q-bus-compatible, Winchester-disk-based system available in a variety of configurations, a spokesman said. All versions are based on the vendor's SMS Foundation Architecture and include a system enclosure, choice of fixed and removable peripherals, LSI-11 processor and memory.

A Foundation Module, the hardware implementation of the SMS Foundation Architecture, reportedly integrates the mass storage device controller, two serial communication ports, all backplane circuitry and the support monitor subsystem on a single board, without requiring one of the backplane slots, the vendor said.

Prices for the Model 40 start at $5,800 for a configuration consisting of a Foundation Module with two serial ports; a 12M-byte Winchester disk; a 5¼-in., 800K-byte floppy disk; an LSI-11/23 CPU; and 256K bytes of main memory in floor-stand or rack-mount enclosures.

Scientific Micro Systems, 777 E. Middlefield Road, Mountain View, Calif. 94043.

ZAX CORP.
• In-circuit emulators

Zax Corp. has announced a series of in-circuit emulators designed to convert the IBM Personal Computer into a software and hardware development system for non-IBM systems.

The Zax ICD-178 68000 is a standalone system said to emulate the Motorola, Inc. 68000 family of microprocessors. Running to 10 MHz, it

Continued on page 86

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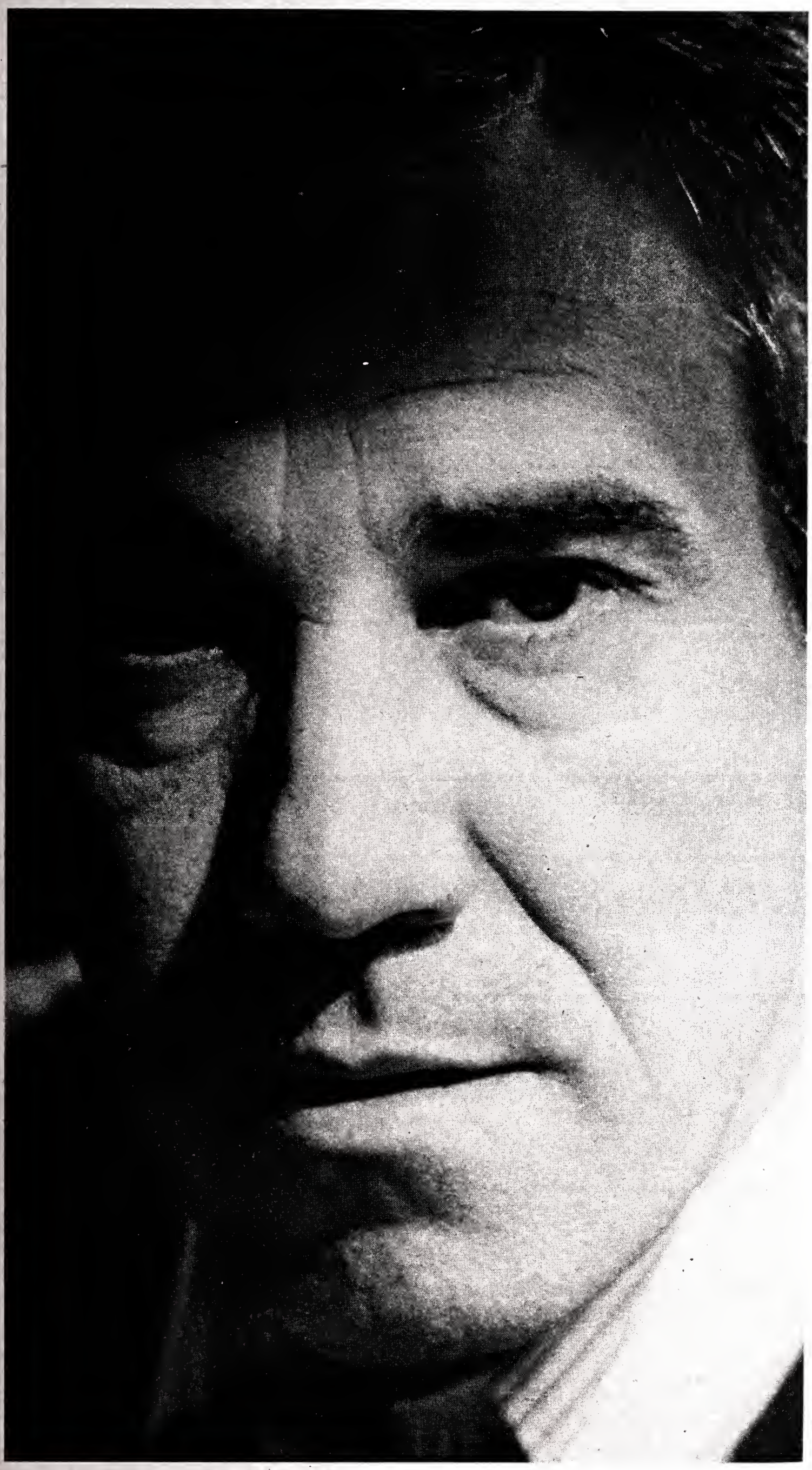

"When you're talking about putting sophisticated computer systems in the hands of non-computer users, you're talking about a heavy training commitment. And I don't mean a bunch of ten-pound user manuals and a see-you-later. A lot of computer companies forget that."

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From day one.

And from the beginning, Wang people have made support and service their number one priority.

WANG

The Office Automation Computer People.

CW30

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MICROCOMPUTERS

Continued from page 84

reportedly features 128K bytes of emulation memory, expandable to 256K bytes. The system costs $7,995.

The Zax ICD-278 Z80H is designed to emulate the Zilog, Inc. Z80H microprocessor. Running at 8 MHz, it is said to feature 64K bytes of mapable memory, an in-line assembler and displays in hexadecimal/Ascii or disassembled code. The system is priced at $4,995.

The Zax ICD 178 8048 is said to emulate the Intel Corp. 8048 family of microprocessors in one unit to 11 MHz. It features 4K bytes of emulation memory and is priced at $4,995.

Software designed to work with the emulators is available at prices ranging from $450 to $1,250.

Zax, 2572 White Road, Irvine, Calif. 92714.

PRINTERS/PLOTTERS PERIPHERALS

AMDEK CORP.
5000 series printers

Amdek Corp. has unveiled the 5000 series of letter-quality printers, featuring daisywheel printing and providing up to 125 char. on a single wheel and a variety of typefaces.

The three printers are the 5025, a transportable 25 char./sec printer; the 5040, a desktop 40 char./sec printer; and the 5055, a desktop 55 char./sec printer.

Prices are $799 for the 5025, $1,675 for the 5040 and $1,990 for the 5055.

Amdek, 2201 Lively Blvd., Elk Grove Village, Ill. 60007.

NORTH ATLANTIC INDUSTRIES, INC.
Model 7065

North Atlantic Industries, Inc. has released Model 7065, a multimode printer.

The printer stores 40 letter-quality fonts on-line, the vendor said. The printer features automatic proportional spacing and justification, friction feed, tractor feed and automatic bold, repeat and underline capabilities, according to the vendor.

The Model 7065 prints at speeds varying from 65 to 300 char./sec and in near-letter-quality, letter-quality and graphics modes, according to the vendor.

Model 7065 costs $1,995.

North Atlantic Industries, 60 Plant Ave., Hauppauge, N.Y. 11788.

DATAPORT
Letter-quality printer

Dataport has announced a letter-quality printer said to weigh five pounds.

The printer has an elite 12-char. font, a Centronics Data Computer Corp. parallel port and a surge suppressor. It reportedly prints 15 char./sec.

The printer supports bidirectional printing, an 80-col. width and the Ascii 96-char. set, according to the vendor. Dataport claims that mean time between failures is more than 16.5 million characters and mean time of repair is 15 minutes.

The printer costs $295.

Dataport, Building A, 5525 Olinda Road, El Sorbrante, Calif. 94803.

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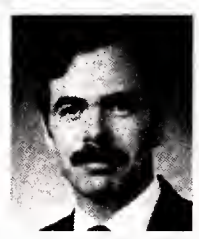
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AUXILIARY EQUIPMENT

VOTAN, INC.
VPC 2000

Votan, Inc. has introduced the VPC 2000, a voice card that provides voice recognition, speech generation and telephone management capabilities in one package for the IBM Personal Computer.

VPC 2000 software is said to let the user incorporate voice input capabilities into existing software packages without any modification to the application software itself.

The VPC 2000 printed-circuit board plugs into any of the long auxiliary system bus slots on the IBM Personal Computer, Votan said. The microphone, speaker, software and documentation reportedly are included on the board.

Available late this month, the product is priced at $2,450.

Votan, 4487 Technology Drive, Fremont, Calif. 94538.

STAFF COMPUTER TECHNOLOGY CORP.
The Key

Staff Computer Technology Corp. has introduced a high-security version of The Key, a hardware and software package that protects software from unauthorized access.

A user can chose from 24 quintillion (24 times 10^{18}) different inquiry and response pairs, according to a spokesman for the vendor. The great number of different pairs reportedly allows the user to chose a unique code for each software package.

The Key is available for Apple Computer, Inc.'s Apple II and IBM's Personal Computer and Personal Computer XT.

The product is priced at $155.

Staff Computer, Suite J, 10457 Roselle St., San Diego, Calif. 92121.

SOFTWARE

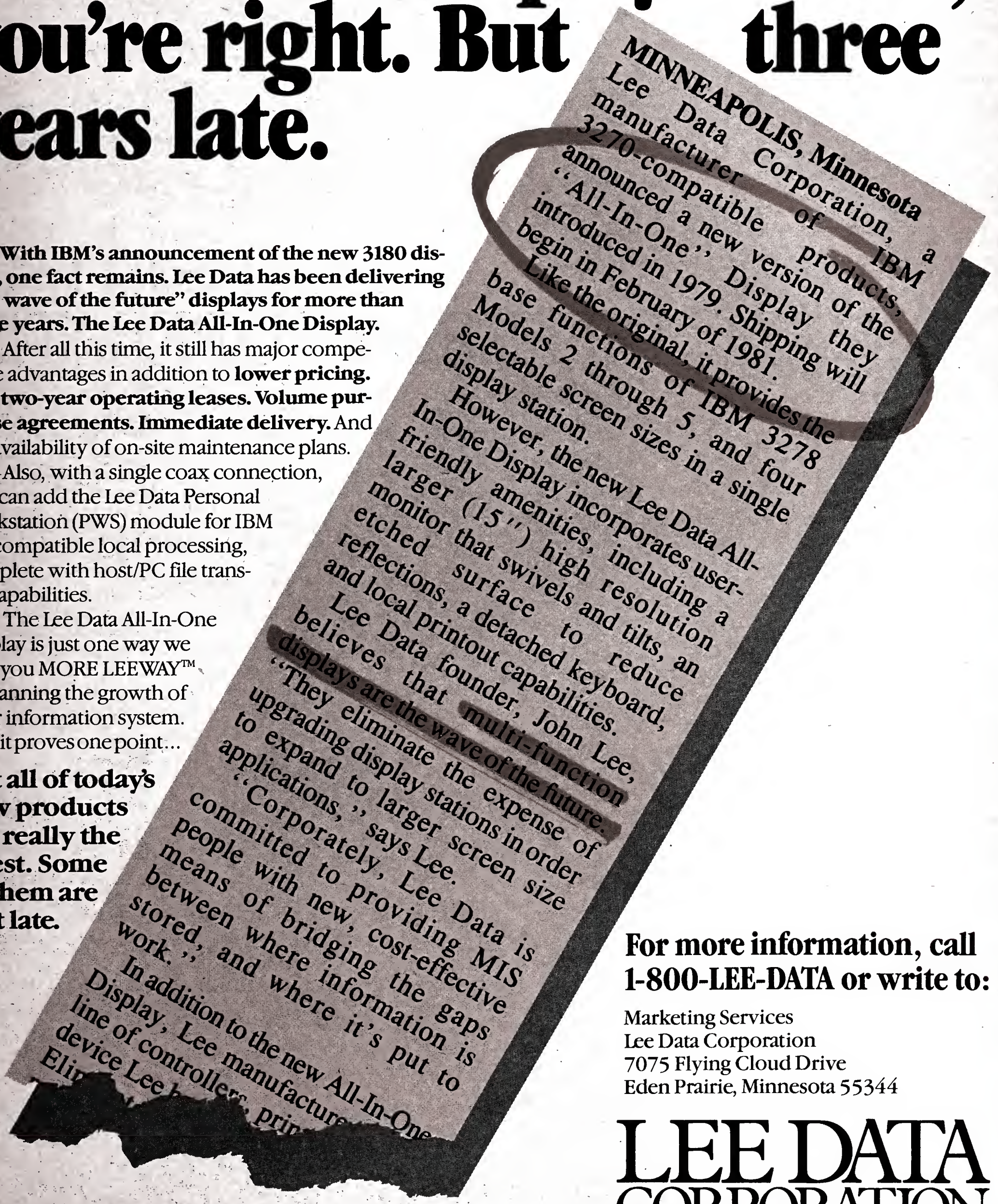
NEC INFORMATION SYSTEMS, INC.
Analyst; Executive; Presenter; Designer

NEC Information Systems, Inc. has announced four graphics software packages for its Advanced Personal Computer (APC) microcomputer.

The systems, dubbed the Analyst, the Executive, the Presenter and the

Continued on page 88

If you think four IBM screen sizes on one display is news, you're right. But three years late.



With IBM's announcement of the new 3180 display, one fact remains. Lee Data has been delivering "the wave of the future" displays for more than three years. The Lee Data All-In-One Display.

After all this time, it still has major competitive advantages in addition to **lower pricing.** Like **two-year operating leases. Volume purchase agreements. Immediate delivery.** And the availability of on-site maintenance plans.

Also, with a single coax connection, you can add the Lee Data Personal Workstation (PWS) module for IBM PC-compatible local processing, complete with host/PC file transfer capabilities.

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Eden Prairie, Minnesota 55344

LEE DATA CORPORATION

MICROCOMPUTERS

Continued from page 86

Designer, each contain a graphics package, an APC graphics subsystem board and 128K bytes of random-access memory.

The Analyst is said to be an integrated spreadsheet system that allows users to enter and manipulate data and create bar, line or pie charts on the monitor or in hard copy.

The Executive system integrates data base, spreadsheet, graphics, word processing, forms creation and telecommunications into a single package that allows a user to retrieve information and present it graphically. The Presenter package comes in two versions, one of which is screen-oriented for producing slide presentations, the other plotter-oriented for producing paper copies and overhead transparencies.

NEC's Designer computer-aided design system is intended for architects, structural engineers and electrical engineers.

The graphics packages cost $848 each for monochrome versions and $998 each for color versions.

NEC Information Systems, 1414 Massachusetts Ave., Boxborough, Mass. 01719.

VALLEY SYSTEMS, INC.
Conversion Aid

Valley Systems, Inc. has announced Conversion Aid, a software package that allows files from IBM System/34 and System/36 minicomputers to be used by microcomputer application packages such as Lotus Development Corp.'s Lotus 1-2-3.

Conversion Aid selectively accesses fields and records from System/34 or System/36 files and allows the user to modify the selection at execution time, the vendor said. Files can then be downloaded to 5¼-in. diskettes, according to the vendor.

Conversion Aid costs $350.

Valley Systems, 4207 W. Griswold, Phoenix, Ariz. 85021.

SOFTWARE RESEARCH TECHNOLOGIES, INC.
Smartkey II Plus

Software Research Technologies, Inc. has introduced Smartkey II Plus, a software utility for the IBM Personal Computer that cuts repetitive keystrokes.

Users can reportedly assign a series of characters or commands to any key. Extensive commands, boilerplate text and repetitive functions can be entered by a single keystroke, the vendor said.

Smartkey II Plus costs $89.95.

Software Research Technologies, Suite 211, 3757 Wilshire Blvd., Los Angeles, Calif. 90010.

SOLVATION, INC.
Manufacturing Planning and Control System

Solvation, Inc. has announced the Manufacturing Planning and Control System for use with its Series 7000 multiuser microcomputer.

The system consists of six interactive modules: inventory, bill of materials, purchasing, order processing, production planning and word processing. It is designed to control manufacturing processes for small manufacturing companies.

The modules are priced between $650 and $1,995.

Solvation, 150 Flanders Road, Westborough, Mass. 01581.

DATAMATE CO.
Fastfile

Datamate Co. has introduced Fastfile, a personal data base system for IBM Personal Computers and compatibles.

Fastfile is a specialized version of Datamate's English-language report writer, Enquery, that allows the user to print or display custom reports whenever needed.

The program is available for Microsoft, Inc.'s MS-DOS and IBM's PC-DOS 1.1 and 2.0. It requires 128K bytes of storage and a monochrome or color monitor, according to a spokesman for the vendor.

Fastfile is priced at $495, the vendor said.

Datamate, Suite 128, 4135 S. 100th East Ave., Tulsa, Okla. 74146.

DIGITAL INFORMATION SYSTEMS CORP.
Enhanced DBL

Digital Information Systems Corp. has enhanced DBL, its business programming language.

DBL has been rewritten in C and runs on Hewlett-Packard Co.'s HP 150, IBM's Personal Computer, Data General Corp.'s Model 10, Wang Laboratories, Inc.'s Professional Computer and Digital Equipment Corp.'s Rainbow.

DBL is a subset of DEC's Dibol-11 and is upwardly compatible with DEC's Dibol 83, the vendor said.

DBL is priced at $499, the vendor said.

Digital Information Systems, Suite 340, 3336 Bradshaw Road, Sacramento, Calif. 95827.

TRANSTIME TECHNOLOGIES CORP.
Datamat

Transtime Technologies Corp. has introduced Datamat, a productivity and decision support program.

Datamat creates bar charts and scatter charts, possesses mathematical and statistical functions and is capable of forms generation and text processing, the vendor said. The package also includes an application generator, according to Transtime. Datamat is reportedly relational, integrated and menu-driven.

Versions of Datamat run under Unix, Microsoft, Inc.'s MS-DOS and Digital Research, Inc.'s CP/M.

Prices range from $200 to $1,000.

Transtime Technologies, 797 Sheridan Drive, Tonawanda, N.Y. 14150.

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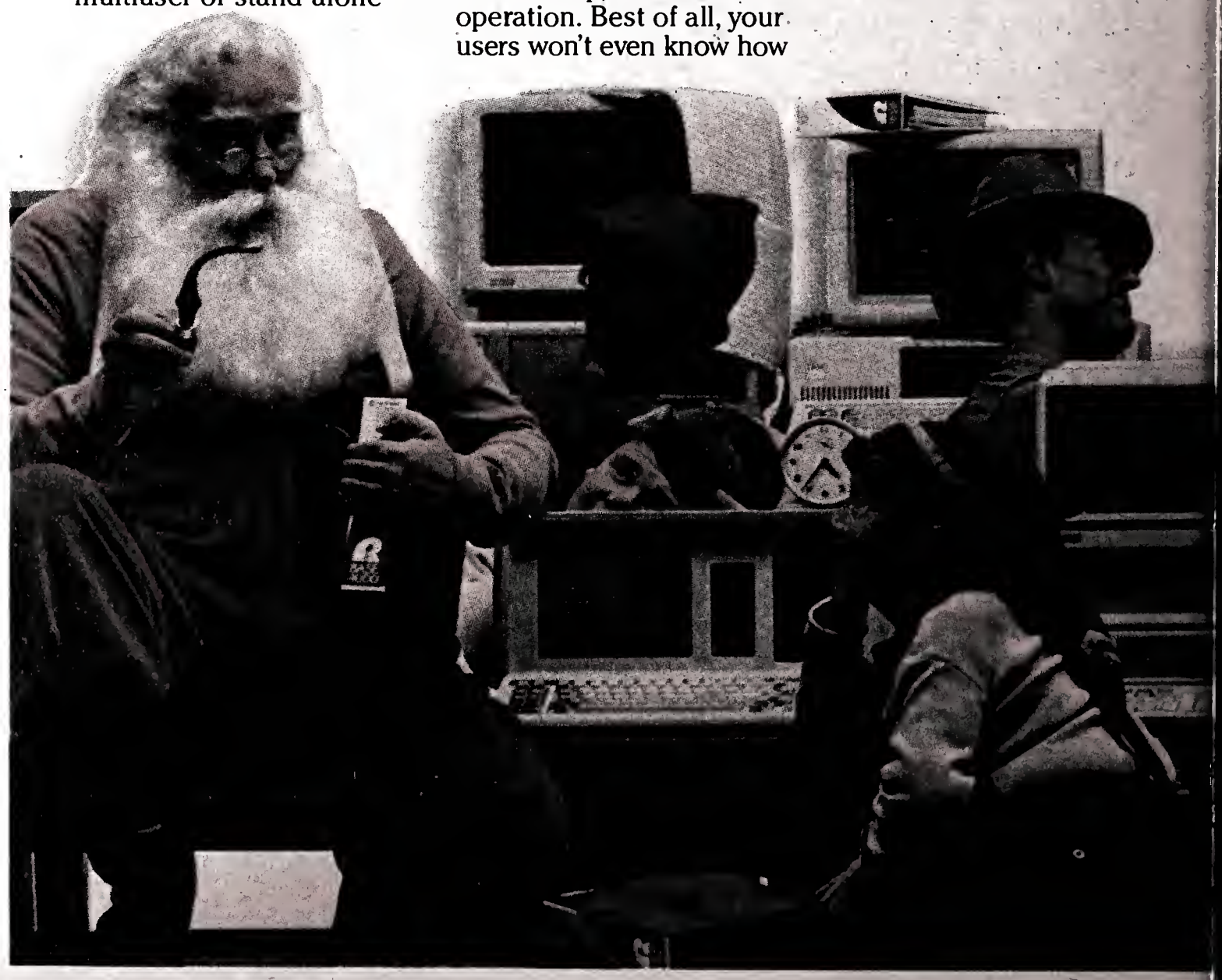

MICROCOMPUTERS

TRUCKS from page 83

The pilot project, which begins May 1, marks the first occasion food wholesalers have joined together in a computerized distribution network, Coyne said.

'Start of something big'

"We regard this pilot project as the start of something big," he maintained. "From this nucleus of 28 wholesalers, we plan to build a nationwide network and have the entire nation on-line in the years ahead," Coyne explained. Nawga has 333 company members throughout the U.S.

The Backhaul system uses a modified version of Quik-Load, a software package from International Data Communications Corp., running on the Mark III network.

GE paid for the software modification, which cost well in excess of $100,000, according to a company spokesman.

As part of the pilot project, GE is encouraging wholesalers to use its Mark III network by making it available free of charge for the first two months.

Following that, the wholesalers will be billed on the number of transactions they perform, GE said. To advertise on the network will cost approximately $3, while a successful match to buy or sell a shipment will cost between $6 and $7.50.

For those network users who lack IBM Personal Computers, GE will also offer the micros free of charge for the first month. GE is a major distributor of IBM Personal Computers, according to Dennis Weigel, the company's manager of transportation marketing.

Greatest receptivity

"We felt the [Personal Computer] would have the greatest receptivity in the wholesalers marketplace, and that is why it was chosen," Weigel said.

Setting up the network "took six weeks of communicating with the chief executives of the 28 companies and holding a meeting of the principals involved before we could launch the pilot," Coyne noted.

The Mark III network's host mainframe processors, a series of Honeywell, Inc. DPS 8 systems, are housed at data processing centers in Cleveland, Rockville, Md., and Amsterdam.

EAGLE from page 83

Turbo XL costs $2,000 less than a comparable 1600 microcomputer, according to Petersen. However, the 1600 features bundled word processing and spreadsheet software, while Turbo XL includes only Microsoft's MS-DOS and Basica.

Eagle plans to ship 500 Turbo XLs this month and 1,000 in each following month.

Also this month, the company cut the price of three products. The cost of the portable Eagle PC Spirit dropped from $3,295 to $2,995. The desktop Eagle PC Plus-1 now costs $2,195, and the PC Plus-2 is offered at $2,495.

Eagle Computer is headquartered at 983 University Ave., Los Gatos, Calif. 95030.

OLIVETTI from page 83

Inc. Z8000 alternate processor board, which is required to run Pcos.

In addition to stand-alone operation, the M24 can act as an intelligent workstation in distributed data processing environments or integrate into IBM 3270 terminal networks, Olivetti said. The system is available now in Europe, with prices starting at about $3,200, according to a spokesman.

Olivetti's new M21, a transportable version of the M24 weighing 30 lb, features a 9-in. display and houses either one or two floppy disk drives. The system also connects to an external 10M-byte hard disk drive. European shipments will begin in September. Pricing was not released.

In addition to the agreement under which AT&T will buy 25% of Olivetti, a recent contract calls for the European manufacturer to supply AT&T with $250 million worth of computer workstations.

Meanwhile, Docutel/Olivetti Corp. in Irving, Texas, will evaluate the new machines as possible additions to the line of personal computers Docutel markets in the U.S.

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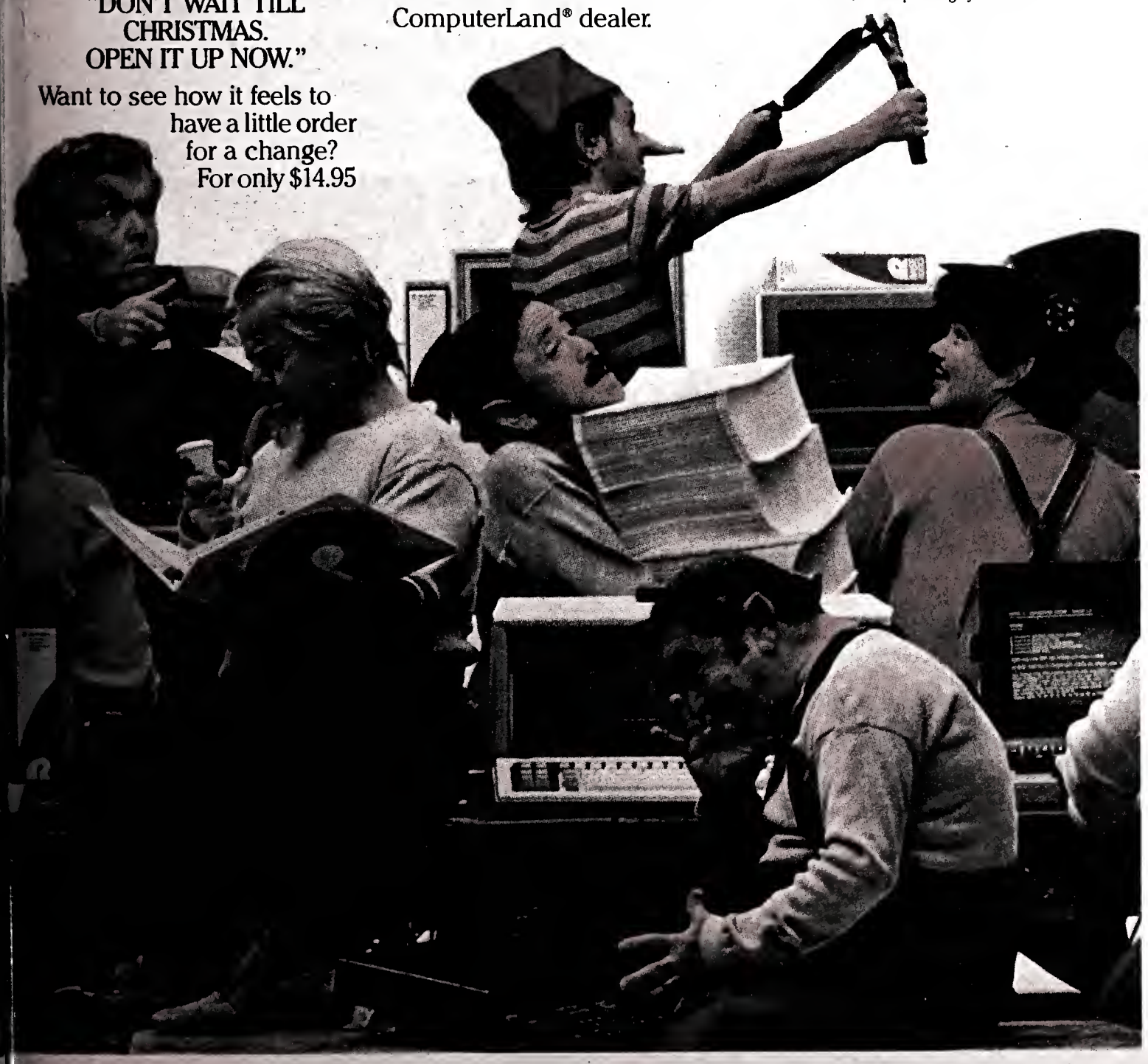

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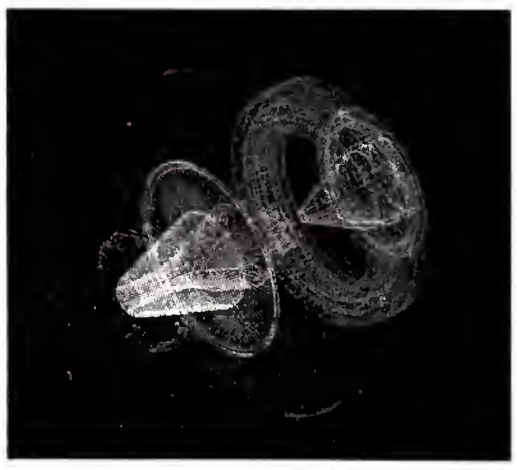

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COMPUTER INDUSTRY

INDUSTRY INSIGHT
Peter Bartolik
CW Senior Editor

Stratus matures, looks to future

Stratus Computer, Inc., the young upstart chasing Tandem Computers, Inc.'s dominance of the fault-tolerance processor market, took one big step in the growing-up process last week and seems intent on taking perhaps an even bigger step soon.

By offering two new models of its hardware-based fault-tolerant concept, the company increases its attractiveness to what seems to be a rapidly increasing market.

By the end of this year, at the earliest, the company plans to adopt a Unix-compatible operating system that should go a long way in minimizing the company's major shortcoming — a lack of third-party applications software.

The selection of Motorola, Inc.'s 68000 chip for the original Stratus/32, now called the FT 200, may be a crucial factor in Stratus' fortunes. The 68000 seems to be the chip of choice for Unix-based systems, and Motorola claims to have designed it with future enhancements in mind. In the two recent releases, Stratus uses the next chip in line, the 68010.

Given the growing interest in Unix, and the possibility that Apple Computer, Inc. may make the 68000 family a standard to compete against Intel Corp. products, Stratus may have the potential to become a very desirable product in many settings that require a processor standing between IBM mainframes and networked microcomputers.

While ideal for banking and stock house transactions, Stratus computers are presently also in use in retail, manufacturing, services, scientific and distribution environments, including an automated factory being built by none other than Motorola. That type of varied experience at such a young age will serve the

See **STRATUS** page 104

Nixdorf notes industrial trend

West German entrepreneurs starting to win respect

WELLESLEY, Mass. — West Germans lack the entrepreneurial spirit that has characterized U.S. commerce, but both government and established industry have taken steps in the past two years to promote innovation, according to Heinz Nixdorf, founder and chairman of Nixdorf Computer AG.

Nixdorf

Speaking recently at Babson College here, where he was inducted into the business school's Academy of Distinguished Entrepreneurs, the West German businessman said his nation's economy traditionally has been dominated by old companies with lucrative and unshakable ties to government.

An example is Siemens AG, a long-established company that practically dominates the government post office's $7 billion investment portfolio. "You could say [Siemens] invented Germany," Nixdorf said.

But in the past two years, he said, Siemens has attempted to motivate developers to leave the company, offering financing for former employees to start their own companies. Additionally, the government has a program to allocate $1 billion to small, young companies in an attempt to spur innovation. Presently, there are more venture capitalists than there are entrepreneurs, he claimed. "It might be too fast, this rain of dollars; but better too fast than never," Nixdorf said.

Nixdorf started his entrepreneurial career in 1952, after failing to convince a colleague to start a company to develop Nixdorf's idea for a mechanical calculating machine. "He said to me, 'If it's as easy to make as you say, make it yourself,' " Nixdorf recalled.

Funded with $6,000, he did build the machine for the biggest power utility in West Germany; in 1962 he developed the first desktop calculator with built-in printer, and in the 1960s and 1970s he developed a line of small business computers. Remarking on the success of the microcomputer market, he recalled that in 1965 he developed a small computer priced at $5,000, but it failed to sell as well as a model priced at $20,000. Today, the company has reported sales just short of $1 billion and offers models ranging in price from $4,000 to $800,000, all able to use the same software, he said.

See **NIXDORF** page 104

AMD, FBI investigate sale of bad chips

By David Olmos
CW Staff

SUNNYVALE, Calif. — Advanced Micro Devices, Inc. and federal agents are continuing investigations into the sale of defective semiconductor chips that may have been routed through the Far East before purchase by Wyle Laboratories, Inc.

Wyle said it has fired two employees in connection with the incident, and Advanced Micro Devices said it is investigating the possibility of involvement by one or more of its own employees.

Mormac Technology, Inc. of Canoga Park, Calif., a distribution company that said it sold the chips to Wyle, claimed the chips were obtained from a Hong Kong-based company, Super Spark Ignition Systems. The Hong Kong company informed Mormac in a telex message on April 8 that the chips were obtained "through official channels in Singapore," according to Jeffrey Brodey, an attorney for Mormac.

A spokesman at the San Francisco office of the Federal Bureau of Investigation said the probe is continuing, and there have been no indictments yet. He declined to say whether the investigation has extended to the Far East.

The problem was discovered in March when a Digital Equipment Corp. facility in Phoenix returned a number of defective 64K-byte and 128K-byte erasable pro-

See **CHIPS** page 104

Allen Michels, president and chief executive officer of Convergent Technologies, Inc., discussed "appetite management," or how to avoid getting indigestion while munching up a healthy share of the market/**97**

■ A Japanese government agency failed to meet a deadline for proposed recommendations on a controversial software protection bill, but American observers aren't convinced the issue is dead yet/**92**

■ Intel Corp. and NCR Corp. posted record first-quarter profits and revenues, but Rolm Corp., despite a 41% increase in revenues, posted lower earnings per share than last year/**94**

■ Compaq Computer Corp. has reorganized in preparation for broadening its product base and has established a telecommunications subsidiary/**96**

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Japan buries copyright bill; U.S. fears it may resurface

By Jake Kirchner
CW Washington Bureau

WASHINGTON, D.C. — The Japanese government has failed to propose legislative recommendations on a controversial new form of software protection in that country, but U.S. government and business officials who have opposed the plan fear it may resurface at a future date.

The issue concerns a plan by the Japanese Ministry of Trade and Industry (Miti) to replace software copyright with a new, patent-like protection, reducing coverage to only 15 years and allowing for mandatory licensing in certain instances.

The plan, along with a proposal to limit foreign ownership in Japanese value-added networks, has been strongly opposed by U.S. industry with the support of U.S. trade officials. The two groups have begun deliberations on possible forms of retaliation against the proposals [CW, March 26].

In addition, the Japanese education ministry, which has jurisdiction over copyright in that country, also opposed the Miti software plan. Faced with U.S. opposition and the lack of a unified Japanese government position, Miti missed a March 27 deadline to present to the Diet, the Japanese parliament, legislation to restructure the software protection law.

Eliminates ownership provision

The value-added network proposal was modified to eliminate the ownership provision and endorsed by the Japanese cabinet April 6. That plan still would allow Miti to refuse foreign network applicants on certain technical and financial grounds and is still opposed here.

Industry and government officials here expressed relief that the software proposal did not go forward, and some suggested Miti may let plans for the new law die quietly as a face-saving measure. However, one high-ranking American trade official, who like others involved in this sensitive issue asked to remain anonymous, said, "I do not believe the measure is dead.

"We will continue to be alert to the issue. . . . We have no intention to put it aside," he said, adding: "The fact that a bill has not gone forward to the Diet . . . at this point is no guarantee that a bill will not go forward in the future."

The U.S. will be looking for hard evidence that "the inadequacies and wrongheadedness of the proposal have been recognized and abandoned," he said.

A U.S. electronics industry executive who has been following the controversy closely commented that this is a reprieve, not a permanent victory, although he termed the failure of Miti to propose legislation "very significant" and "at least a temporary victory."

Similarly, Oliver Smoot, executive vice-president of the Computer and Business Equipment Manufacturers Association, which has insisted the Miti proposal violates international copyright treaties that Japan has signed, said the association does not feel confident the issue is resolved. He suggested Miti may be trying to reach a consensus position with the education ministry before submitting a modified software proposal.

Ralph Thomson, American Electronics Association senior vice-president, said, "I am only cautiously optimistic" and predicted continued negotiations on the subject between the two governments.

But noting the vigor of the U.S. opposition to the Miti proposal and the possibility of strong American retaliation if it goes forward, he added, "I am pleased that there has been a standing back from the precipice [to allow] rational discussion to continue."

Control Data, Philips announce joint venture in optical recording

NEW YORK — Control Data Corp. and N.V. Philips' Gloeilampenfabrieken recently announced here a joint venture to design, manufacture and market optical recording peripherals and associated media.

The two companies and their affiliates previously established cooperative development ventures in 1982 by forming Optical Media Laboratory in the Netherlands and Optical Peripherals Laboratory in Colorado Springs.

The new venture, Optical Storage International, will continue to operate the two development centers and will establish headquarters in Santa Clara, Calif., where optical drives will be manufactured. Media for the drives is expected to be manufactured at a Philips plant in England, officials said.

The Laserdrive 1200 product presently being field-tested, according to CDC spokesmen, features a cartridge-enclosed 12-in. disk composed of two glass substrates bonded together and coated on the inside with a metallic layer on which memory will be recorded, or burned, by a beam of light generated by a laser diode. It reportedly will store 1G byte of nonerasable memory on each side, and the drive will incorporate CDC's previously announced Intelligent Standard Interface.

Philips to own 51%

Philips will own 51% of the partnership, while CDC will own the remaining 49% and will manage the venture. Amyl Ahola, currently vice-president of the Santa Clara disk division of Magnetic Peripherals, Inc., a CDC subsidiary, was named chief executive officer of the venture. Ahola previously was vice-president of Computer Peripherals, Inc., a joint venture managed by CDC.

J. H. Caldwell, vice-president of operations for Control Data Peripheral Products Co., said during the New York announcement that the lifetime of the data stored on the optical disk is expected to be greater than 10 years. He said CDC expects optical memory products to represent 10% to 15% of the total computer storage market at the end of the next five years.

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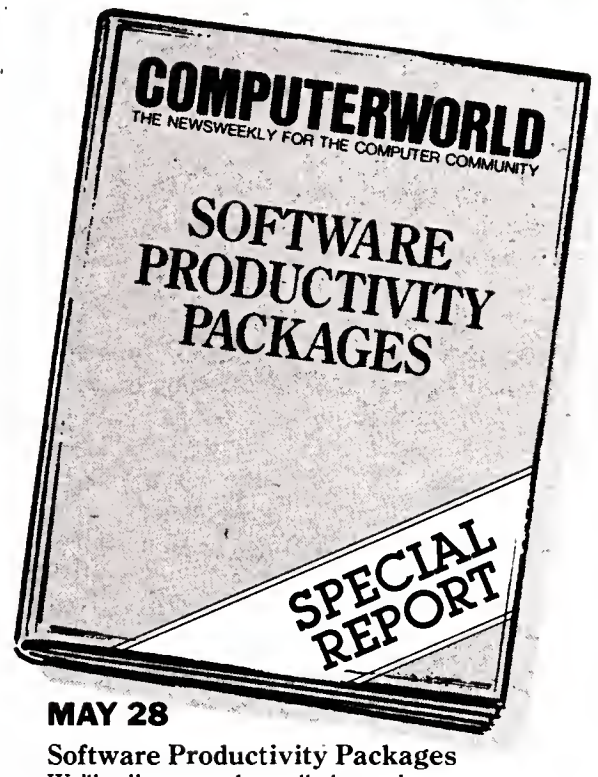

MAY 28

Software Productivity Packages
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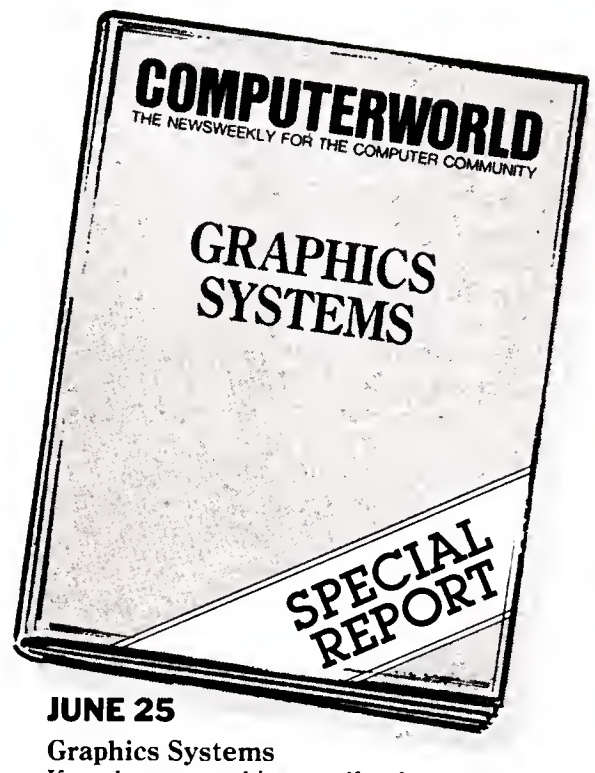
Closes May 11.



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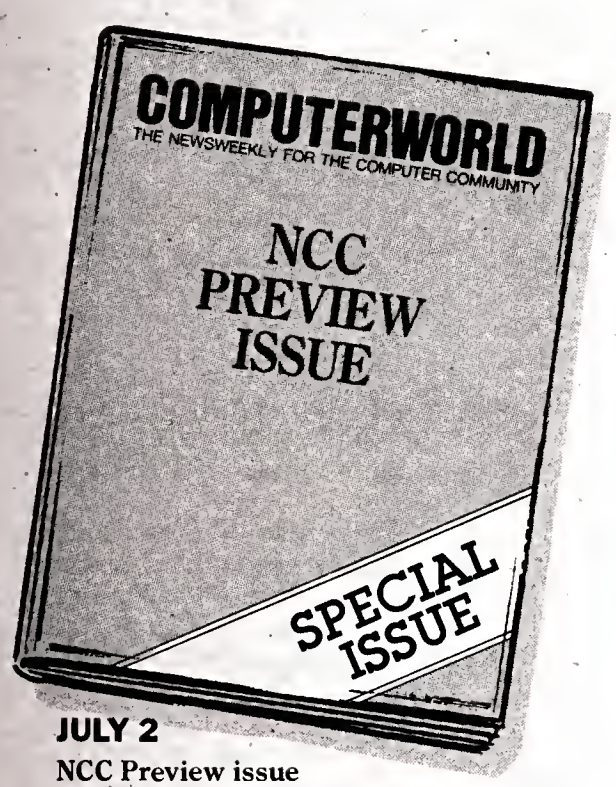
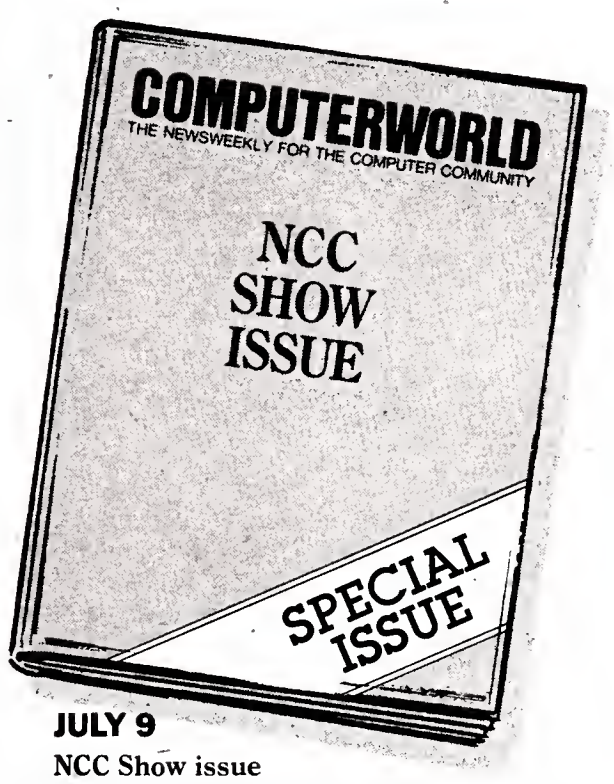


JULY 2

NCC Preview issue
A detailed roundup of the vendors and products to see at the show (complete with booth numbers). Plus we'll take a look at the special attractions in Las Vegas.
Closes June 15.



JULY 9

NCC Show issue
We'll highlight *Data Pro's* yearly hardware survey. Readers always enjoy studying other user's candid ratings of systems and vendors.
Closes June 22.

JULY 16

NCC Wrap-up issue
Part 2 of *Data Pro's* hardware survey. Also, we'll let readers in on the major product announcements and happenings at the show.
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Rolm posts revenues jump

SANTA CLARA, Calif. — Rolm Corp. recently released financial results for the third quarter ended March 30, reporting revenues of $176 million, 41% above the comparable period one year ago, and an increase in profits to $10.2 million, compared with $8.7 million a year ago. Per-share profits declined to 40 cents per share, from 43 cents a year earlier, because of an additional 5 million outstanding shares.

M. Kenneth Oshman, president of Rolm, said he was pleased the revenue figure was about $5 million above what had been expected several weeks ago [CW, April 2] when the company said revenues would fall below stock analysts' expectations of between $175 million to $180 million.

Alluding to the low per-share profits, however, Oshman said, "Our primary focus in the upcoming quarter will continue to be on profitability." For the nine-month period ended March 30, profits increased a mere $31,000 over the comparable period in 1983, and per-share earnings were off 38 cents due to a 7.1 million-share increase in outstanding shares.

While revenues in the third quarter were 40% greater than in the comparable period one year ago, cost of sales reportedly grew more than 60% during the same time frame, and total costs and expenses increased by 40%.

Intel net income, revenues rise to record level in first quarter

SANTA CLARA, Calif. — Intel Corp. recently reported that its net income and revenues rose to record levels during the first quarter ended March 31.

Net income during the quarter more than quadrupled to $50.2 million, or 43 cents per share, compared with $12 million, or 12 cents per share, during the corresponding period last year.

Revenues increased 56% to $371.5 million, up from $237.5 million during last year's first quarter.

"For many of our products, the demand exceeds supply, and there is little evidence that users are accumulating inventory," said Gordon E. Moore, chairman and chief executive officer. He said the company has been concentrating on expanding production of those products in heavy demand.

NCR reports profits up 34%, revenue up 10%

DAYTON, Ohio — NCR Corp. last week reported a 34% increase in profit for the first quarter ended March 31 from a revenue increase of 10%, in comparison with the first quarter of 1983.

The company said it experienced record earnings, revenues and orders for a first quarter.

Profit for the quarter was $45.5 million, or $1.70 per share, compared with $34 million, or $1.25 per share, during the year-earlier quarter. Worldwide revenues were $861.4 million, compared with $781.3 million one year ago.

Charles E. Exley Jr., president and chief executive officer, noted the improved revenue growth was achieved despite the strength of the U.S. dollar abroad.

Exley also said the company experienced record orders across all product lines and that all geographic areas except the Middle East and Africa showed gains during the quarter.

ADP reports third-quarter earnings gain

ROSELAND, N.J. — Automatic Data Processing, Inc. (ADP) recently reported that it realized record revenues and profits for the third quarter ending March 31.

Revenues of $234.9 million for the quarter were up 18% over the $198.7 million reported for the comparable period in 1983. Profits also increased by 18%, to $22.1 million. Earnings per share were 63 cents, up 17% from 54 cents in 1983.

Josh S. Weston, the president and chief executive officer of ADP, said that the revenue growth "included a continuing strengthening of payroll-related transactions, which account for 35% of the company's revenues." Weston went on to say that he expects results for the upcoming fourth quarter to show a similar rate of growth.

In another recent announcement, ADP's Comtrend Division announced that an agreement had been reached with Equatorial Communications Co. for satellite broadcast of the Trendsetter quotation service offered by Comtrend.

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In 1981, a study by Hubbard Research revealed that "overall confidence in security provided by CICS is minimal... and that CICS users feel the system's security provisions are inadequate for an expanding on-line usage." Since that time, software advances have brought thousands of additional end-users and hundreds of new remote locations into the on-line environment.

In addition, with more companies merging today than ever before, the consolidation of computer facilities has created different kinds of on-line security concerns from those experienced in the past.

The solution to modern CICS security needs is a system which can handle the entire on-line environment:

- System resource security to control transactions and inquiry/update of files.
- Terminal resource security to decrease exposure to unauthorized usage.
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With the addition of ALERT/CICS, the Goal Systems International product line has expanded beyond basic systems and performance products into a full line of CICS-based products.

Denny Yost, National Sales Manager for the XP product line said, "Since 1975, Goal has been a leading developer and marketer of software products. ALERT/CICS represents the first in what will be a series of products to expand those capabilities into the CICS environment.

"We are known as a responsive company, one with technically sound products backed up by reliable support. We are excited to be able to put our resources solidly behind the CICS user base."

ALERT/CICS is good news for any CICS installation concerned about on-line information security. It is one of the Extended Productivity Systems from Goal Systems International and is available for a free trial. For more information, call Goal Systems toll-free today at

800-848-4640 (In Ohio 800-628-4640).

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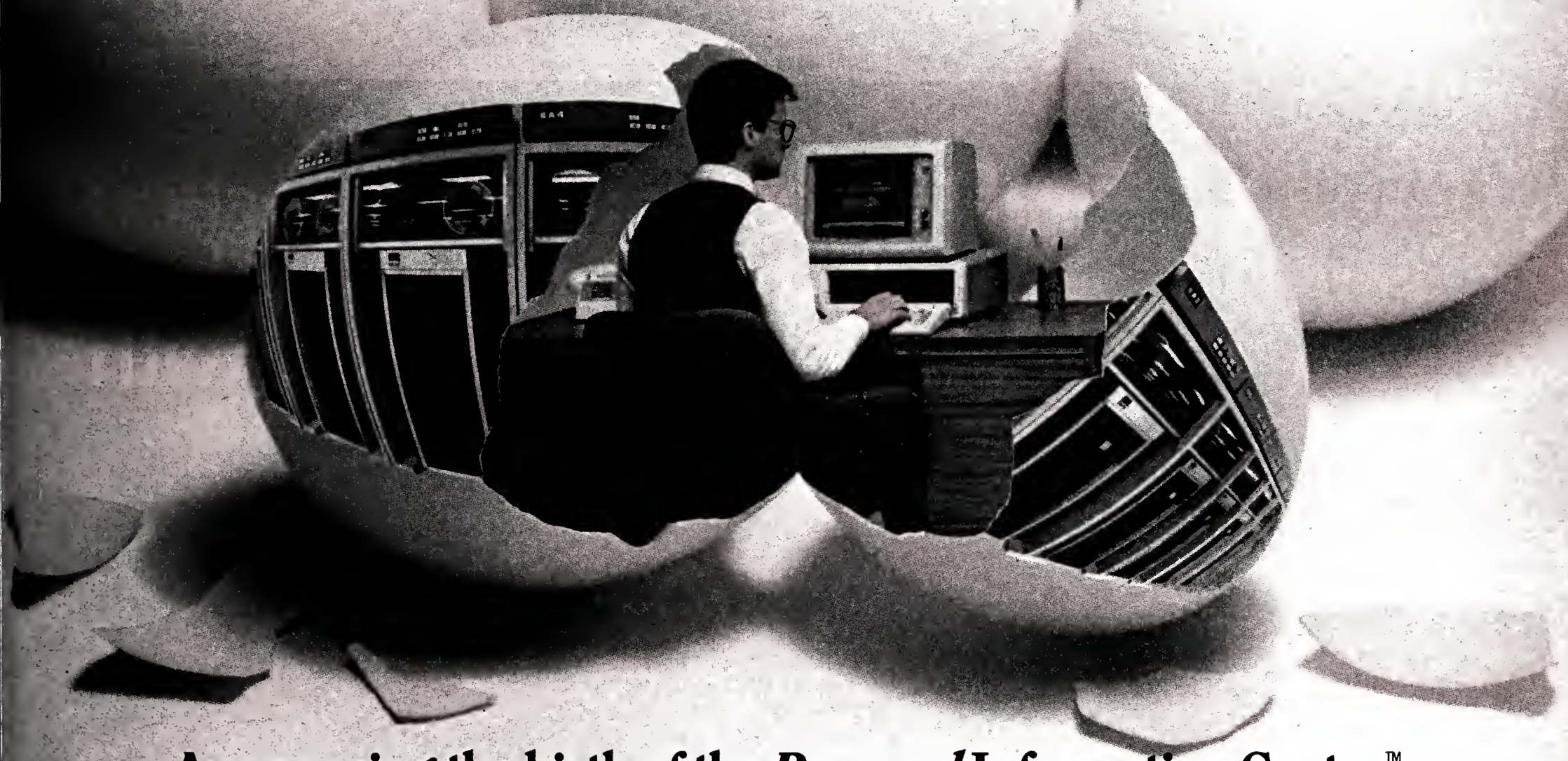

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Compaq launches subsidiary, European marketing

HOUSTON — Compaq Computer Corp. recently announced the creation of a telecommunications subsidiary, the European introduction of its existing products and the formation of three divisions to develop and market separate families of products.

Compaq Telecommunications Corp., which will be located in Dallas, will be involved in the development of advanced telecommunications technologies that will be reflected in future products, according to Rod Canion, Compaq president and co-founder.

Canion also announced that the Compaq Portable and Compaq Plus computers will be introduced to the European market initially by sales through computer specialty stores in West Germany and the UK.

According to Canion, the three divisions created in the reorganization are: the Portable Computer Division, responsible for the Portable and Plus and headed by Senior Vice-President Jim Eckhart, formerly president and chief executive officer of Prentice Corp.; the Office Computer Division, responsible for development and marketing of products that will provide the company with "a full family of office computers," headed by Vice-President Kevin Ellington, formerly of Proximity Corp.; and the Advanced Computer Division, responsible for incorporating advanced technologies, headed by Compaq co-founder and Vice-President Jim Harris, with the third co-founder, Bill Murto, named as vice-president of marketing.

President of Franklin resigns post

PENNSAUKEN, N.J. — Avram C. Miller resigned his position as president and chief operating officer of Franklin Computer Corp. recently, after only 13 months with the company. Franklin also announced it laid off 70 of its 550 employees.

Franklin co-founder R. Barry Borden, chairman and chief executive officer of the company, reportedly will assume Miller's duties.

In a prepared statement, Miller, who joined the firm from Digital Equipment Corp., said his "real interest was in developing a large, broadly based company engaged in microcomputer applications beyond the personal computer industry." However, "such a framework would simply be unrealistic to impose on Franklin at this time."

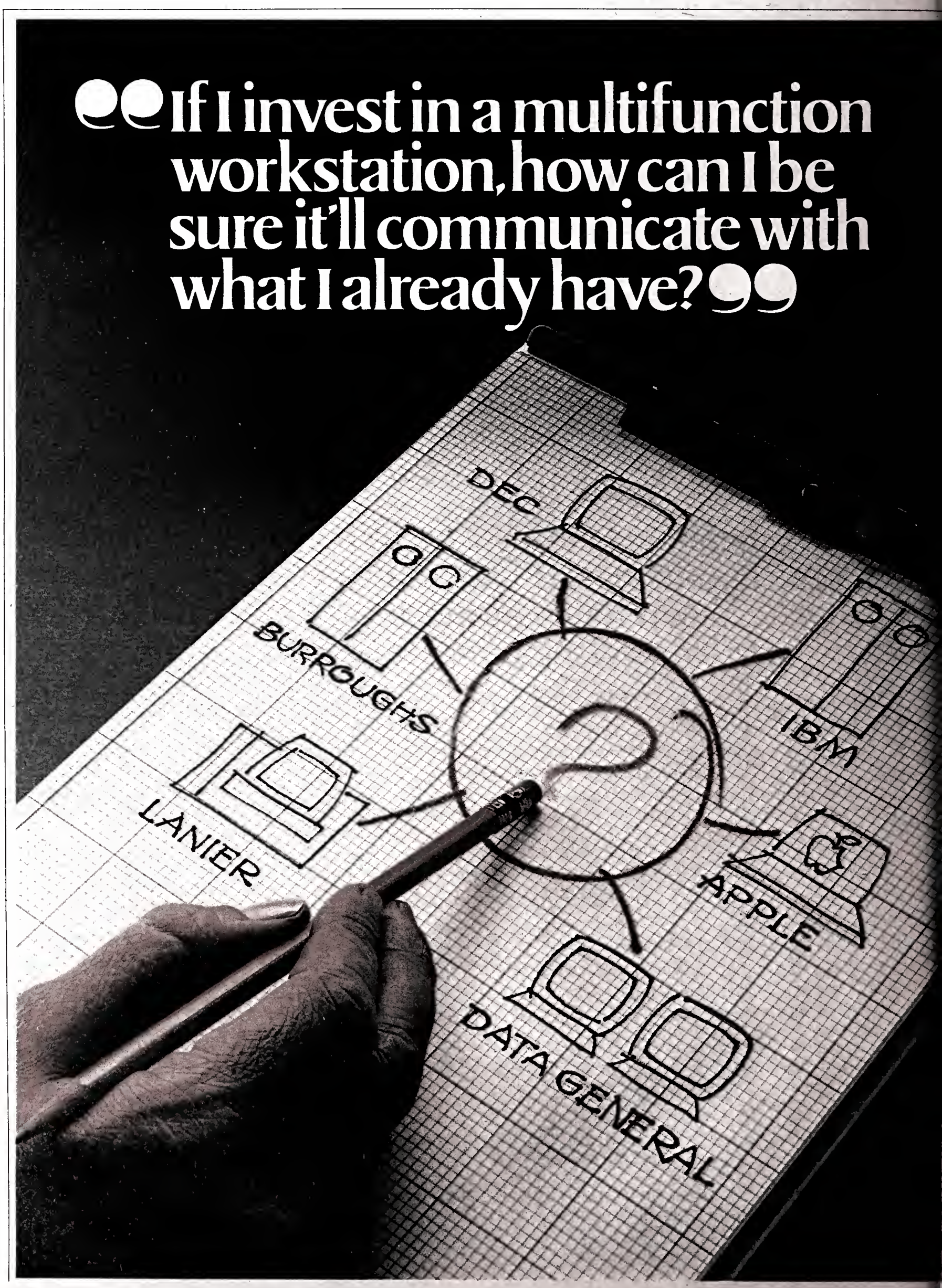
Franklin recently started shipping its microcomputers with its own proprietary operating system after agreeing last year to desist shipping machines with an operating system that Apple Computer, Inc. claimed was infringing on Apple's copyrights.

AMD sales increase 98%

SUNNYVALE, Calif. — Advanced Micro Devices, Inc. (AMD) reported fourth-quarter revenues of $192.2 million, up 98% over the same period in fiscal year 1983.

The company reported fourth-quarter earnings of $30.6 million, or 53 cents a share, up 360% over the same period last year.

Revenues for the year ended March 25 were $583.3 million, a 63% increase from last year's revenues of $358.3 million. A net income of $71.1 million, which included a $5 million tax credit, was up more than 300% from last year's $20.9 million.



Traffic management skills cited as vital to growth

Convergent head focuses on direction of rapidly moving firms

By Robert Batt
CW West Coast Bureau

LOS ANGELES — The focus for rapidly moving companies should be on the process of "appetite management," according to Allen Michels, president of Convergent Technologies, Inc., the Santa Clara, Calif.-based manufacturer of computers and workstations.

In a recent interview here while attending a management conference, Michels, a former manager at Intel Corp. and Digital Equipment Corp., said, "A young company cannot afford to eat so much that it causes indigestion, because that can lead to serious adverse consequences.

"Rather, a fast-growing divergent computer company, with better than average profits, needs to be skilled in the art of traffic management.

"It needs to know how fast the industry is moving and in what direction. The trick is to move with the times, but not so fast that you go careening off the road," Michels explained.

Convergent, founded four years ago and regarded in many industry circles as highly successful in producing products for the OEM market, has itself caused some alarm to industry watchers.

That alarm was sounded because of a 22% drop in fourth-quarter profits in 1983 and the prospect of further depressed quarters in 1984.

Track record defended

Michels defended the company's track record, claiming the company is in a period of transition from being a company with one product — the AWS workstation family — to having a three-product line.

Those three products now include: the much-touted N-Gen workstation, the Megaframe multiuser system and the Workslate portable computer.

But sales of the AWS products accounted for all but about $10 million of the firm's more than $160 million sales revenues for 1983, according to the company.

Convergent is expected soon to announce a single processor that is a compatible, low-end companion to Megaframe.

Michels said 1983 was a year of heavy investment in new products for Convergent, with $13 million being taken away from profits because of product diversification.

He predicted, "1984 will be the year when these investments pay off."

OEM supplier

Michels said Convergent would remain primarily an OEM supplier, despite its recent deal with AT&T Information Systems, Inc., in which the company agreed to design, develop and manufacture microprocessor-based systems exclusively for AT&T to market.

"We have no plans to become an end-user supplier. Rather, we are treating the agreement with AT&T as a long-term market arrangement," Michels commented.

The chief executive said that, within the U.S., Convergent's toughest competition is often its own customers, who buy the company's products and ship them with value-added software.

"This places on us a responsibility to be agile, innovative in product development and to seek economies of scale in manufacturing. We are a product company, and our success will be through quality products brought to market early and at competitive prices," he concluded.

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MSA's Graves foresees rise in firm's revenues for 1984

By Edward Warner
CW Staff

BOSTON — The largest U.S. software supplier, Atlanta-based Management Science America, Inc. (MSA) expects this to be a much better year than 1983, when the firm's stock price took what MSA's president, Bill Graves, recently called a "roller coaster ride," and net income rose only 20% to $10.8 million.

According to data presented by Graves to a group of securities analysts here, MSA's net income will grow to $18 million, a boost of 67%. The firm is also expecting its operating revenues to rise 34% this year, from $139.1 million to $187 million.

One income source the firm feels is lagging, though, is foreign software sales, which only climbed 28% to $29.2 million in 1983 because, Graves said, the firm was "not closing business in some markets where we should have closed more business." Foreign sales accounted for 21% of the firm's total sales last year.

Graves said it was in the foreign market for mainframe software that MSA did the worst. In the foreign microcomputer software market, the firm had less cause for complaint, with an increase in revenues of 69%, from $2.9 to $4.9 million, in 1983. MSA is predicting foreign microcomputer software sales to rise 43% to $7 million this year.

He admitted that his firm's revenue is highly seasonal because the majority of its business is in mainframe software, where most business is closed in the fourth quarter. But, he said he looks to the company's growing involvement in microcomputer software, which is much less seasonal, as a way to offset this trend.

Last year, the company acquired Eduware, a California educational software firm, and Graves said, "We really see the micro business as being very involved with educational software." In 1983, microcomputer software sales only accounted for 16% of the firm's $139.1 million revenue.

Most of MSA's 1983 revenue came from mainframe software ($117.4 million), mostly for applications in finance and manufacturing. Yet, the firm has no systems software, such as a data base management system (DBMS) in its line.

Graves claimed the lack of a DBMS was no handicap to his firm because "you can buy our general ledger operation under IBM or [Cullinet Software, Inc.'s] data base." This, he argued, gives the MSA line greater flexibility. Systems software, he said, "is not dramatically material to being in the application software business."

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DPMA appoints Sheehy as its manager of governmental affairs

PARKRIDGE, Ill. — The Data Processing Management Association (DPMA) has named Therese Sheehy as its manager of governmental affairs.

Sheehy will be responsible for coordinating activities of the DPMA legislative network and reporting on legislative developments affecting information processing at all governmental levels.

Sheehy has been a staff research assistant for the Illinois Senate Minority, client services director for a contract lobbyist and editor of legislative publications for the Illinois State Chamber of Commerce. She is said to have nearly seven years experience in legislative and regulatory activities. She is a graduate of Sangamon State University and is studying there toward a master's degree in public administration.

Sheehy is a member of the Association of Public Administrators and Women in Communications, Inc.

Zilog to manufacture, market NEC's V series microprocessors

MOUNTAIN VIEW, Calif. — Nippon Electric Co., Ltd. (NEC) announced here recently the signing of a license agreement granting Zilog, Inc. nonexclusive rights to worldwide manufacture and marketing of NEC's V series 8-, 16- and 32-bit microprocessors and peripherals.

The agreement follows an earlier agreement [CW, March 19] granting NEC nonexclusive manufacture and marketing rights to Zilog's Z80,000 32-bit microprocessor.

Both agreements follow a resolution of charges and countercharges filed in federal court and later before the International Trade Commission [CW, Aug. 8, 1983].

Import, infringement charges

Zilog, a subsidiary of Exxon Corp., had charged two NEC subsidiaries with importing microcomputers with circuits copied from Zilog's Z80.

NEC had charged Zilog with patent infringement.

Under the terms of the latest agreement, Zilog will manufacture and market seven Cmos microprocessors, a floppy disk controller, a graphic display controller and an image pipelined processor.

Tandy profits, earnings rise in third quarter

FORT WORTH, Texas — Tandy Corp. reported last week a 9% increase in profits and an 11% increase in sales revenues for the third quarter ended March 31, in comparison to the third quarter of 1983.

Tandy reported profits of $62.5 million, or 60 cents per share, up from $57.3 million, or 55 cents per share, a year earlier. Tandy posted revenues of $656.1 million, up from $589.8 million.

In an offer dated April 5, Tandy is seeking to purchase from 10 million to 15 million shares of the 103.9 million shares of common stock presently outstanding. The company offered to pay $35.50 per share in cash with the offer expiring April 27.

Apple reports second-quarter profits drop

CUPERTINO, Calif. — Claiming to be "exactly where we said we would be," Apple Computer, Inc. last week announced profits for the second quarter ended March 30 of $9.1 million, or 15 cents per share, in comparison to the $23.9 million, or 40 cents per share, reported in the comparable quarter last year.

John Sculley, chief executive officer of Apple, noted the company had announced last November that profits for the first two quarters of 1984 would be lower than in the first two quarters of 1983.

Apple's revenues for the second quarter were $300.1 million, a 32% increase over the $228 million that was reported in the comparable quarter a year earlier, and the second-quarter profit was up from the $5.8 million reported in the first quarter of this year.

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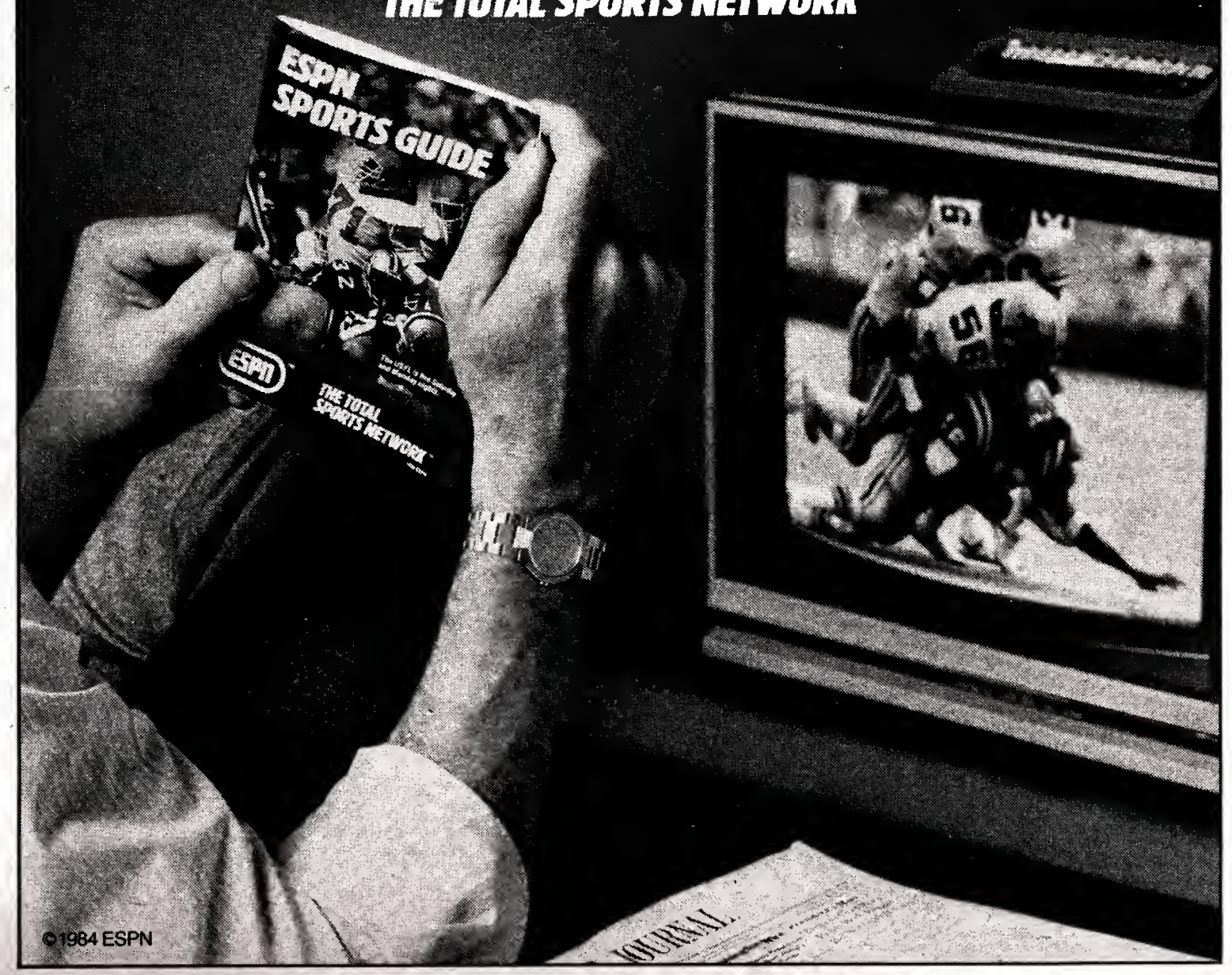

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Arthur Little wins three-year, $3.4 million DOD contract

CAMBRIDGE, Mass. — Arthur D. Little, Inc., the multinational management and technology consulting firm, has been awarded a three-year, $3.4 million contract by the U.S. Department of Defense (DOD) to evaluate the agency's automated medical information systems.

The contract is part of a continuing billion-dollar information systems automation program under the auspices of DOD's Tri-Service Medical Information Systems (Trimis) program office. The program, which began in 1976, was established to develop standardized, efficient and effective health care information and delivery systems incorporating the latest technologies for the U.S. armed forces hospitals.

Under the contract, Arthur D. Little health care specialists will analyze the costs and benefits of implementing various hospital information systems. According to project leader Erica L. Dranzen, the team will monitor and evaluate the automated systems to determine that DOD hospitals are fully utilizing those systems.

Results of the evaluation, which will be made available to the public, will provide the most comprehensive information to date about the costs and benefits of using such systems, according to an Arthur D. Little spokeswoman.

DOD's health care system provides care to some nine million active and retired department personnel and their dependents. The health care network costs some $4 billion annually and includes 166 hospitals and more than 400 clinics in the U.S. alone.

5¢ 10¢ NICKELS AND DIMES

Interleaf, Inc. announced receiving a credit line of $3.3 million from the First National Bank of Boston. The credit facility will add to Interleaf's working capital for sustaining the company's growth.

■

Softech, Inc. has reported a 24% increase in revenue for the third quarter ended February 1984. Net income was $300,000, or 9 cents per share, in the third quarter, compared with $519,000, or 15 cents per share, in third-quarter 1983.

■

The MacNeal-Schwendler Corp. has reported revenues for the year ended Jan. 31 totaled $11.8 million, an increase of 28% over the $9.2 million reported for 1983. Net income was $2.5 million, an increase of 43% from 1983. Net income per share was 45 cents, an increase of 32% over 1983. Revenues for the fourth quarter ended Jan. 31 totaled $3.5 million, an increase of 39% over last year.

■

Seeq Technology, Inc. reported sales of $8.8 million for its second quarter ended March 31, an increase of 70% over first-quarter revenues. The company reported a net loss of $1.4 million, or 10 cents per share, for the second quarter, compared with a net loss of $4.3 million, or 38 cents per share, in the first quarter.

■

VLSI Technology, Inc. reported first-quarter revenues of $14.2 million, up 88% from a year ago. Net income rose to $1.3 million, or 7 cents per share, from a net loss of $1.6 million, or 19 cents per share, in 1983.

■

LSI Logic Corp. announced revenues for the first quarter of 1984 were $14.4 million, a 183% increase over first-quarter 1983 revenues. Net income for the first quarter of 1984 was $3.5 million, or 14 cents per share, a 363% increase.

■

Siliconix, Inc. reported its net income for the first quarter of 1984 was $1.6 million, more than five times the $298,000 reported for the corresponding period a year earlier. Sales jumped to $19.7 million, a 38% increase from 1983.

■

BKW, Inc. reported a loss of $345,014 on revenues of $2.9 million during its second fiscal quarter ended March 31. For the corresponding period in 1983, the company reported a net income of $227,639 on revenues of $729,866.

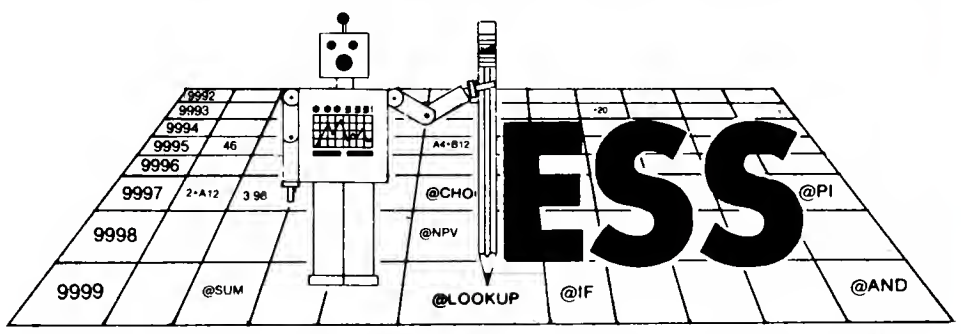
■

Automatix, Inc. reported a 1983 loss of $2 million on record sales of $13 million. This compares with a net loss of $429,000 for the previous year on sales of $8 million. The company has restated sales and earnings for the prior quarters of 1983.

■

Cipher Data Products, Inc. reported net income for the fiscal third quarter ended March 31 increased 122% from the year-earlier third quarter to $3.1 million. Revenues increased more than 58% to $30.3 million.

■



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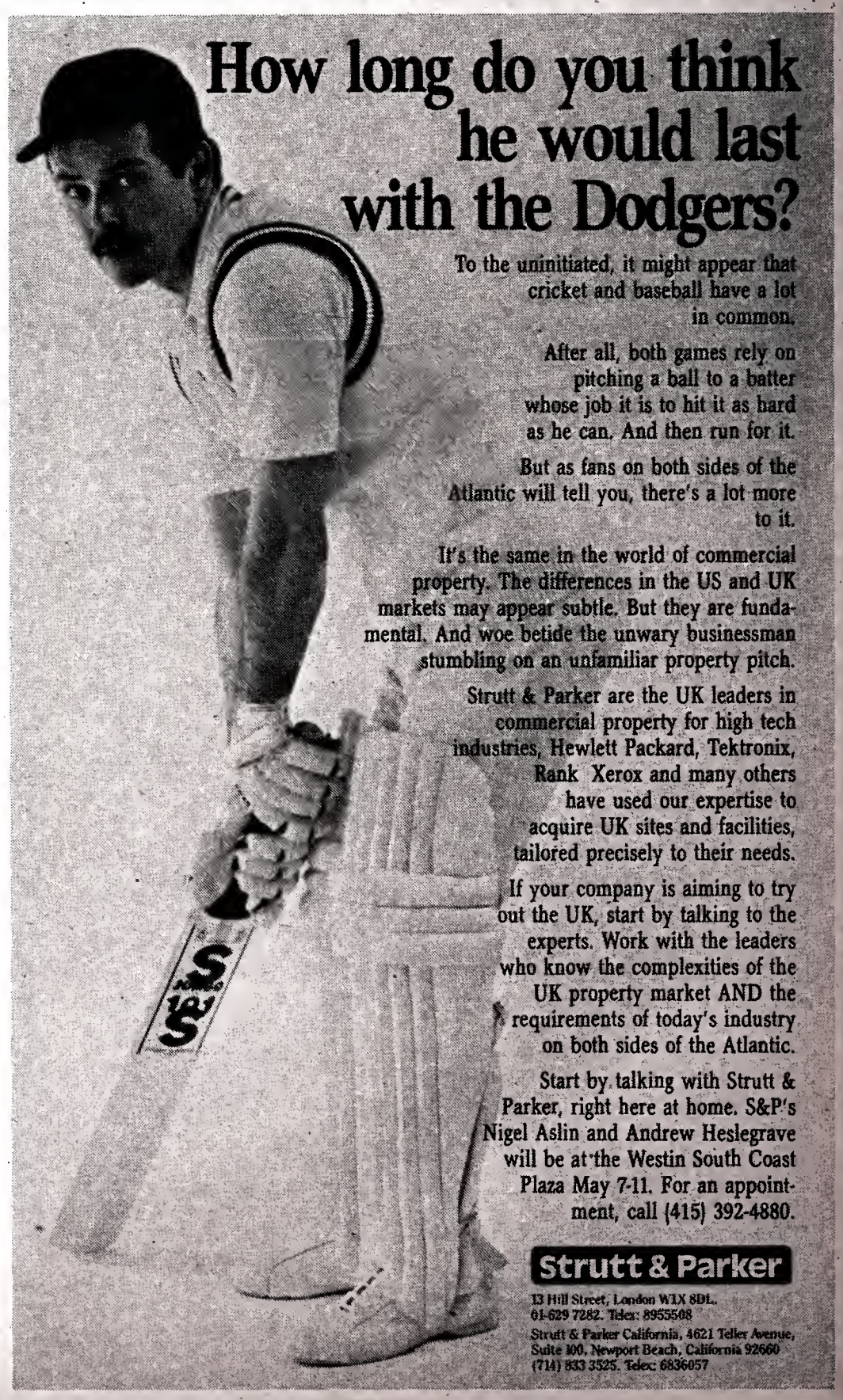

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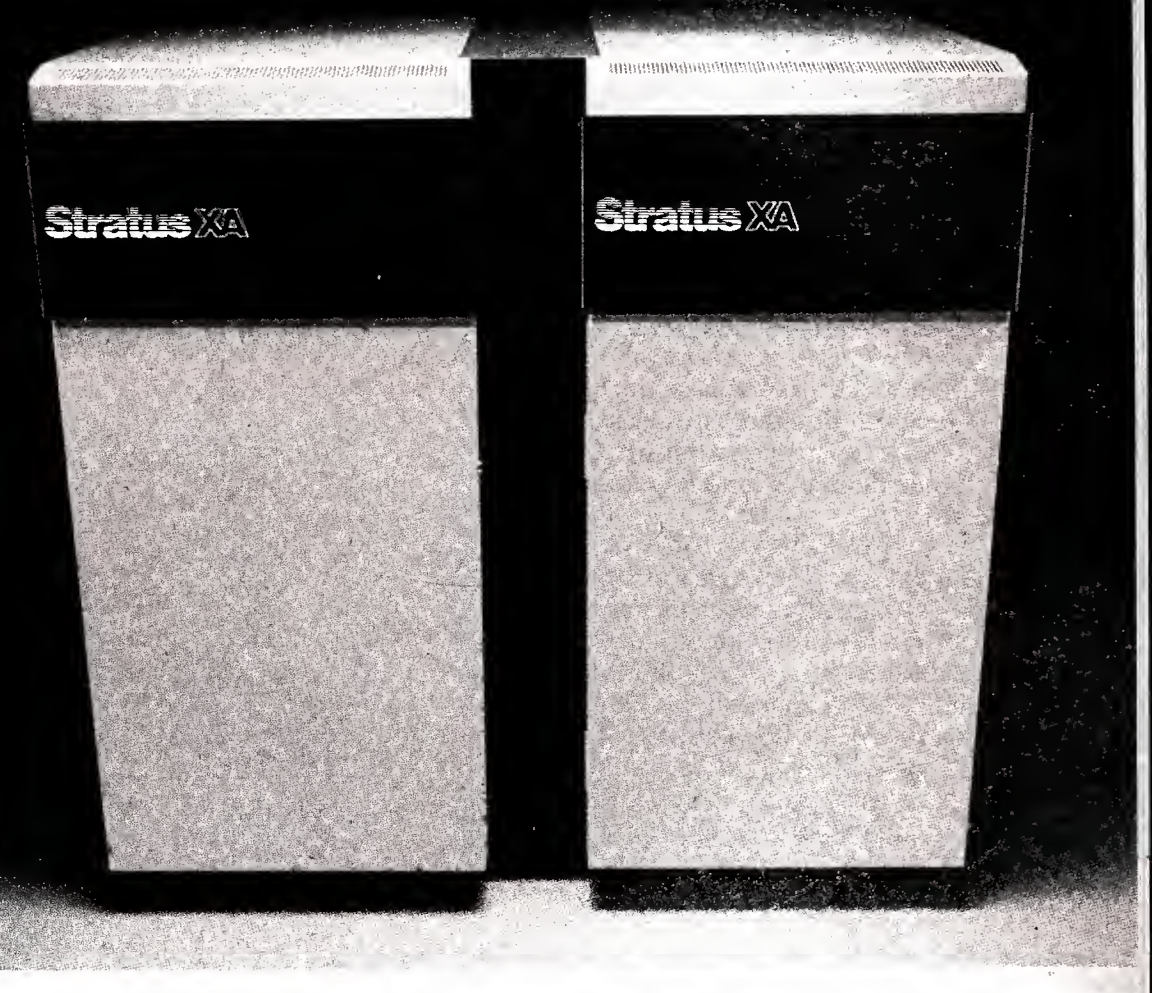

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XA 400

XA 600

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General Electric Co. and **Coherent, Inc.** announced an agreement to operate a joint venture to serve the market for industrial lasers. The transaction is subject to definitive agreements and certain required approvals. Completion of the venture is expected in April.

■

Harris Corp.'s Government Systems Sector Division announced plans to open an electronic systems and software center in Orlando, Fla. The facility will be for the design and development of computer-based test and maintenance systems for the checkout of avionics equipment on military aircraft.

Digital Equipment Corp. announced the donation of $6.3 million in equipment to the University of California at Berkeley computer-aided design and manufacturing (CAD/CAM) center to conduct VLSI design and CAD tool research.

■

Management Decision Systems, Inc. announced that it has agreed to be a value-added remarketer for the IBM 4300 series of mainframe computers.

■

IBM announced that **Para Research, Inc.** has been selected to be a value-added remarketer for the IBM System/36. The value added will be a group of five accounting programs, valued at approximately $10,000.

■

C. Itoh & Co. Ltd. announced a new Waltham, Mass.-based company, called **C. Itoh Digital Products, Inc.**, to handle the retail distribution business of entry-level computer products and office automation-related products.

■

Management Assistance, Inc. (MAI), Sorbus Service Division, has signed an agreement with **IPL Systems, Inc.** to provide nationwide maintenance service for that company's IBM 4300 and IBM 4381 plug-compatible computers marketed as the IPL 4436, 4443, 4445, 4446, 4460 and 4480.

■

Microelectronics and Computer Technology Corp. (MCC) announced the establishment of an "associates program." The purpose of the program is to provide information about MCC research to companies that are otherwise unable to become full participants in the MCC advanced research venture.

Metheus Corp. announced an agreement with **VR Information Systems** to buy Merlyn-G gate array application software. The software will provide users with an integrated solution for gate array design, from schematic entry through layout and testing.

■

Zentec Corp. has laid off 20 employees, 8% of its work force. According to Jeffrey L. Thwaite, president, "We are continuing to put plans into place which will enable us to return to profitability."

■

Control Data Corp. has introduced a new maintenance service for volume users of the IBM Personal Computer and Personal Computer XT that includes a flexible fee plan.

MERGERS AND ACQUISITIONS

Control Data Corp., Minneapolis, announced it has acquired a 25% equity interest in **Interactive Computer Modeling** (ICM), Reston, Va. The investment will reportedly expand CDC's position in engineering graphics software and help ICM establish its market position as a supplier of high-end modeling and visualization software.

■

Burroughs Corp., Detroit, and **Joseph & Cogan Associates, Inc.**, Anaheim, Calif., announced an agreement under which Joseph & Cogan Associates becomes a freestanding subsidiary of Burroughs.

No terms were announced in the assets acquisition of the privately held company.

■

Datavision, Inc. announced that **Sensormatic Electronics Corp.** has an option to purchase 20,435 shares of Datavision's Series B convertible preferred stock for $2 million.

Sensormatic has agreed not to acquire more than a 35% interest in Datavision for an extended period of time.

■

Datapoint Corp. and **Xebec** announced the closing of Xebec's acquisition of the assets and business of Datapoint's Sunnyvale, Calif. division.

The transaction reportedly includes cash and notes totaling over $5 million.

■

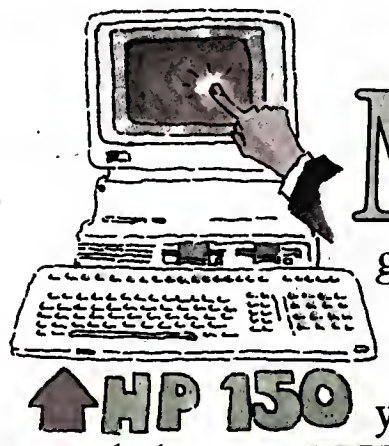
Informatics General Corp., Woodland Hills, Calif., and **Mellonics Systems Development**, a division of Litton Industries, Inc., have signed a letter of intent for Mellonics to acquire Informatics' data services operation based in Fairfield, N.J. The transaction is expected to be completed by the end of April.

■

Banctec, Inc., Dallas, has announced its acquisition of **Scan-Data Corp.** and the Reader-Sorter Division of **Control Data Corp.** Banctec has acquired all outstanding shares of common stock (including B & C series) of Scan-Data Corp., as well as the assets of the CDC Reader-Sorter Division.

Banctec has also acquired all of the debt owed to CDC by Scan-Data Corp.

Is your office operating at a crawl...



Maybe the one thing you need to get off the ground is the Touchscreen Personal Computer. The HEWLETT-PACKARD 150. Because it's no ordinary machine. Remember the first time you approached a personal computer? If it wasn't exactly love at first sight, it was probably because a lot of machines can be pretty intimidating. Especially for first-time users. We've made the Touchscreen Personal Computer so easy to use that people like to use it. Very simply, we've taken out the intimidation factor. We've made the new Touchscreen Personal Computer so easy to operate that even first-time users can use it. Which means they'll quickly grow to love it.

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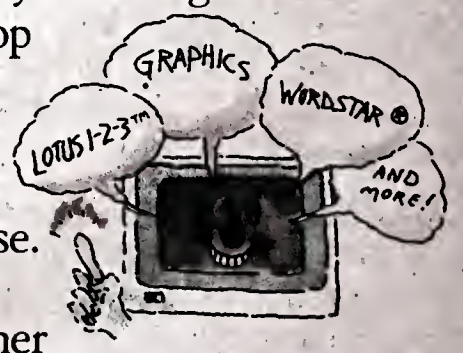

The Touchscreen Personal Computer not only communicates with people. It communicates with other computers, too. Your people are your most valuable asset. But the more information they have at their fingertips, the more valuable they become. The Touchscreen Personal Computer delivers again.

COMPUTER INDUSTRY

EXECUTIVE CORNER

Raymond E. Brooks has been appointed controller of Texor Corp.

■

James C. Fosberg has joined Trilog, Inc. as president and chief operating officer.

■

Eugene W. Buckley has been appointed assistant to the president, computer systems operations, of Sperry Corp.

■

Maj. Gen. Don Evans has been named vice-president of government information services for Cullinet Software, Inc. Evans was most recently the joint program manager for the Department of Defense's Worldwide Military Command and Control System Information System.

■

Richard P. Beck has joined Mastor Systems Corp. as senior vice-president and chief financial officer.

■

James A. Cole has been elected vice-president, marketing and development, of Communications Satellite Corp.'s Comsat Technology Products. **Dr. William P. Osborne** has been elected vice-president, advanced technology, and **Alan Korobov** has been chosen as vice-president, finance.

■

Harry Van Wickle has been named vice-president, Asian operations, of Synertek, Inc., which is a subsidiary of Honeywell, Inc.

■

Eugene Misukanis has been appointed executive vice-president, engineering, at Computer Network Technology Corp.

■

Michael S. Gutman has been appointed vice-president, product engineering, at Apollo Computer, Inc.

■

John Billington has been named vice-president of finance for SKU, a subsidiary of McKesson Corp.

■

Datapoint Corp. has appointed **John T. Hislop II** vice-president and controller of customer service and operations administration; **Jack Trostle**, vice-president of customer service operations; and **Richard Elkins**, vice-president of field operations and technical operations.

■

James R. File has been named vice-president, technical operations, and **Robert F. Brown** has been appointed vice-president, hospitality group, for ATV Systems, Inc.

■

Charles Lamont has been appointed vice-president and general manager of Region 1, International Division of Computer Systems operations, for Sperry Corp., and **Gary S. Roberson** has been named vice-president of Public Sector Marketing in Sperry's Computer Systems operations.

■

H. Michael Kane has joined Oracle Corp. as vice-president, consumer marketing, Microcomputer Products Division. Kane was formerly vice-president of marketing for the U.S. operations of Micro Focus, Inc.

■

John Walsh has been promoted to vice-president, operations, for Braegen Corp.

■

Bert Winemiller has been appointed vice-president of marketing for Computer Corp. of America.

■

Warner C. Blow has been promoted to operations vice-president of Informatics General Corp.'s Distribution and Retail Systems Operation.

■

William W. Barnes has been appointed Manager of Human Resources for Interleaf, Inc.

■

Morris Taradalsky has been named director of MVS programming systems at IBM's Data Systems Division.

■

A. O. Smith Data Systems Co. has appointed the following: **K. A. Byrne**, vice-president, financial industry; **R. Y. Bodine**, vice-president, engineering systems; **W. J. Hadcock**, vice-president of product development, financial industry; **L. W. Spooner**, vice-president of customer services, financial industry; **D. P. Moehrke**, vice-president of product management, financial industry; **D. F. Wood**, vice-president, computer operations; and **W. S. Dryburgh**, vice-president, information systems.

■

James Charnes has been appointed president, chief executive officer and chairman of the board of Evotek, Inc.

■

Benjamin M. Goodwin has been appointed president of Softech Microsystems, Inc.

■

Owen Brown has been appointed vice-president of marketing for the distributed systems division of Convergent Technologies, Inc.

■

Edwin G. McMullen has been promoted to senior vice-president of corporate planning for Lee Data Corp.

■

Dennis M. Peck has been named president, chief executive officer and chairman of the board at Saber Technology Corp. He was formerly the general manager at NCR Corp.'s engineering and manufacturing division in San Diego.

■

Paul L. Rosenbaum has been named president of Proteon, Inc.

■

Stanley E. Tenold has been promoted to vice-president and general

Continued on page 104

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communication

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Permanent Memory:	(ROM) 160K bytes
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Keyboard:	107 keys, 8-ft. cord attaches to system unit. 10-key numeric pad, 12 function keys (8 screen labeled)
Compact Size:	2.1 sq. ft. desk space
Communications:	2 RS-232 ports (Built-in) HP-IB (IEEE-488) (Built-in) IBM 3278 (SDLC, BSC), Up to 19,200 bits per second
Peripherals:	Choice of printers (including optional internal printer), plotters, 3.5" and 5¼" floppy drives (264KB formatted), Winchester hard discs (5 and 15 MB)
Suggested Retail Price:	$3,995.00

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COMPUTER INDUSTRY

Continued from page 103

manager, mil-spec computer division, for Rolm Corp.

■

Theodore C. Papes Jr., an IBM vice-president, has been named president and chief executive officer of the joint videotex venture between IBM, CBS and Sears Roebuck & Co. A committee to oversee operations of the new venture will include three members from each firm. Representing CBS are **Thomas H. Wyman**, CBS chairman and chief executive officer; **Peter A. Derow**, president, CBS/Publishing Group; and **James K. Parker**, senior vice-president and general counsel. Representing IBM are **John F. Akers**, president; **Dean P. Phypers**, senior vice-president and chairman of the Business Operations Committee; and **Richard T. Liebhaber**, IBM director of business development and practices. Sears is represented by **Henry D. Sunderland**, senior vice-president, corporate administration; **Charles F. Moran**, vice-president, corporate planning; and **Wayne E. Hedien**, executive vice-president and treasurer of Allstate Insurance Group.

■

Darrell Baldwin has been named president and chief operating officer of Philips Information Systems, Inc.

■

Charles P. Russ III has been appointed vice-president, secretary and general counsel at NCR Corp.

■

Gary D. Alexander has been promoted to vice-president, central operations, in the computer systems operations of Sperry Corp.

CHIPS from page 91

grammable read-only memory (Eprom) chips to Wyle, an El Segundo, Calif. distributor of electronic parts. Wyle returned the chips to Advanced Micro, which upon inspection found the chips were from a lot it had produced, rejected and thought had been destroyed.

Elliott Sopkin, a spokesman for Advanced Micro, said the chips bore the company's label and had evidently been counterfeited. He said the chips may have been stolen after they were sent out for routine metal reclamation; he explained that some Eprom chips contain small amounts of gold. He added that another possibility is that an Advanced Micro employee was somehow involved in the incident. "We're examining this very carefully," Sopkin said.

Charles Clough, president of Wyle's electronic marketing group, said it had obtained an order of 5,000 chips, and 2,100 of that lot were sent out to 16 customers. Not all of the 2,100 devices were defective, he said. Three customers returned the chips, and the others said the parts were acceptable for their intended use, he added.

Clough said two Wyle product managers violated a "clear company policy" by purchasing the chips from a nonfranchised distributor without receiving authorization from the manufacturer. Those two employees were fired, and six others faced disciplinary action as a result of the incident, Clough said.

Although Mormac has said it sold the chips to Wyle, Clough would neither confirm nor deny that it got the devices from Mormac. Moreover, Mormac spokesman Brodey said Mormac has sold more than $1.3 million of products to Wyle since July 1982.

Advanced Micro spokesman Sopkin said Wyle "has been a good distributor of ours.' "

Brodey said Mormac has been conducting business with Super Spark via telex communications with no face-to-face dealings for two years, but has never had any trouble with products before.

NIXDORF from page 91

He said he is surprised that he has so few competitors in West Germany, but noted that the country has been going through a political and philosophical transition in the past two years, highlighted when former Chancellor Helmut Schmidt "was fired by the workers."

The trend in West Germany and throughout Europe, he said, "is really to see the entrepreneur as a good person. . . . This trend is really new." Claiming that 50% of West German students are "leftists," Nixdorf said the universities are now starting to develop relationships with entrepreneurs, something they would never have done in earlier years.

The primary goal of entrepreneurs in West Germany, according to Nixdorf, is to convince a work force dominated by leftists that free enterprise offers more rewards to workers than does socialism and communism. "My biggest obligation is to make the workers satisfied with the founder, the entrepreneur of this company," he said.

STRATUS from page 91

company well as it seeks to expand.

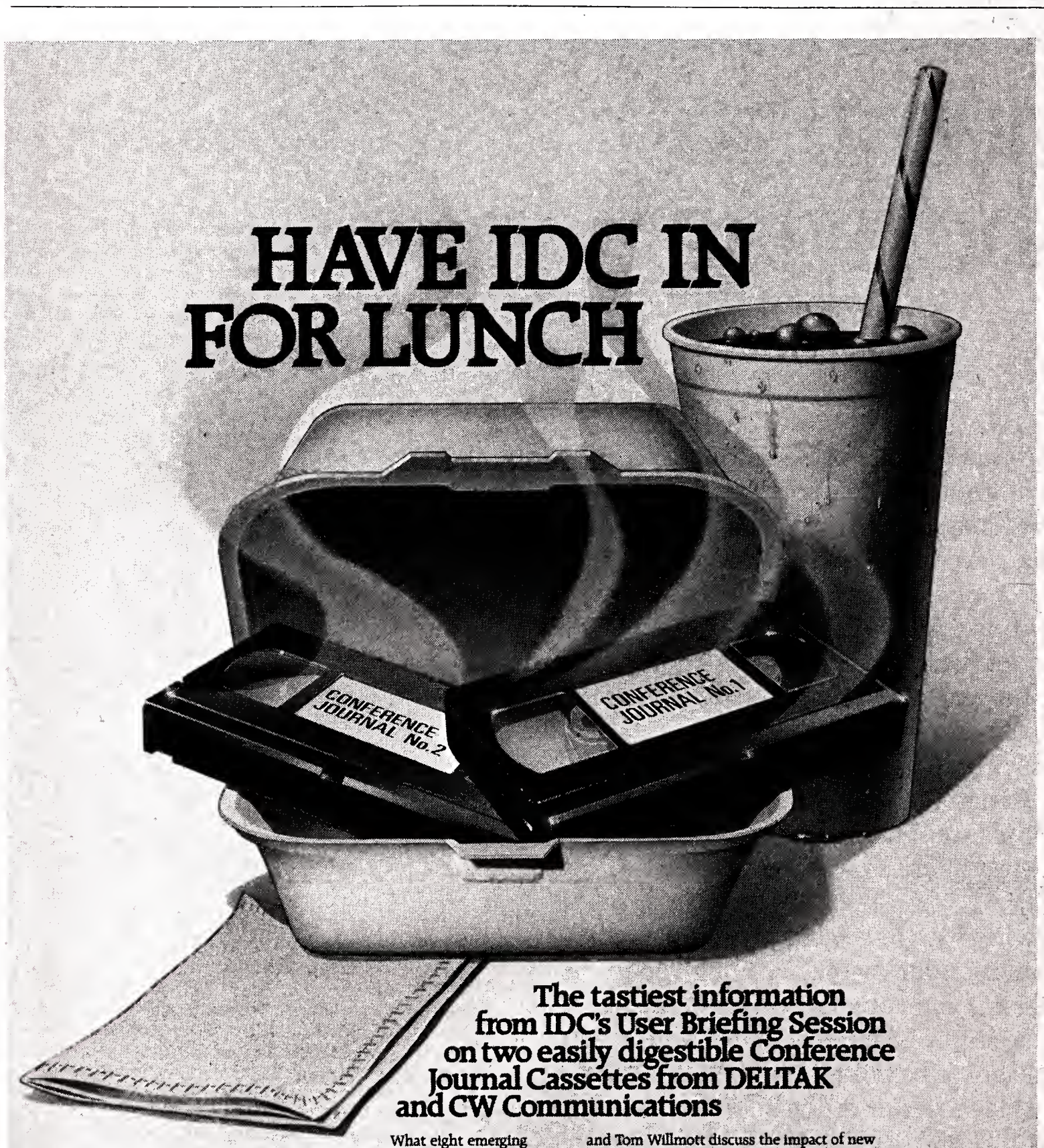
■

Heinz Nixdorf, head of Nixdorf AG of West Germany, recently talked about a practice in his country that really has no parallel here in the U.S.

Speaking at Babson College in Wellesley, Mass., Nixdorf said that West German industry provides 700,000 young people each year with the opportunity for a three-year apprenticeship.

There is no obligation for the business to hire its apprentices at the end of the three-year period, nor is there any obligation for the apprentices to stay with the company.

Nevertheless, Nixdorf said, "We get back our investment many times over, not only in quality but in satisfaction, too."



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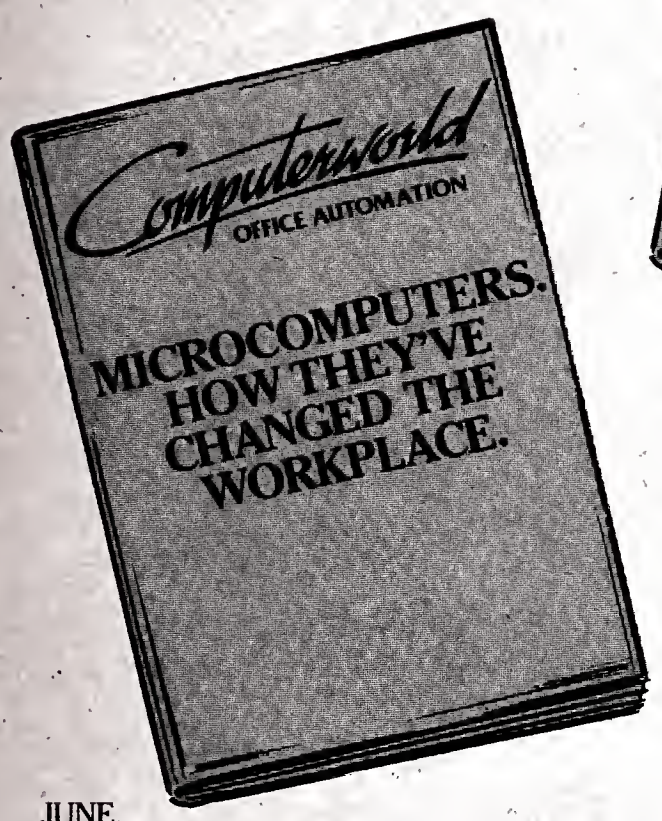

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Pre- and post-sales support of **MODEL 204** including presentations, proposals, trials/benchmarks, analysis of user requirements, customer education and installation. 40% travel. BS/BA or advanced degree preferred; 3-5 years' IBM Systems/Applications experience with heavy emphasis in Operating Systems, Database (IMS, IDMS, ADABAS, etc.) and TP (CICS, VTAM, TCAM, BTAM). Knowledge of database design concepts with hands-on applications experience, marketing orientation, excellent communication/presentation skills. Positions available in Cambridge, MA, Los Angeles, Washington, DC, San Francisco, Pittsburgh, New Jersey, Dallas, Detroit, NYC, and Rochester, NY. **International positions also available.**

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Provide technical support to customers; develop materials and conduct customer education in DC Education Center, on-site or via telephone. Assist in contract consulting/programming. BA/BS (advanced or DP-related desirable) with teaching experience. Knowledge of IBM systems –JCL, programming languages – Cobol, PL1, Assembler, Fortran, DBMS, CICS. TP Monitors experience desirable. Positions available in Denver and Washington, DC.

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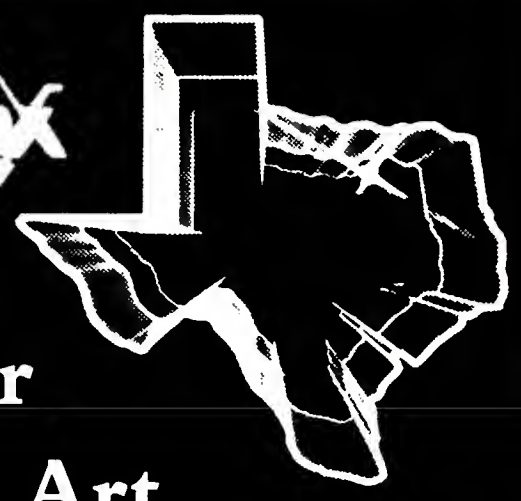

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Xerox, pioneer in reprographics and innovators in the creation of the office of the future, invites you to join our team in Dallas, Texas — one of the fastest growing high-tech centers in the Southwest. Our Information Products Division has exciting challenges for Software Engineers who want a great place for both their lifestyle and their life's ambition.

TeamXEROX is a collaboration of our proven resources and your resourceful mind. And you can be a part of it. We are seeking professionals with the following credentials:

- 1-10 years product development experience with recent experience on Mini/Micro computers with office automation software.
- Must have experience with Assembler language and either PASCAL or C languages.
- A BS or MS in Computer Science is highly desirable.

The successful candidates will apply their software development skills in the following areas:

- **PROFESSIONAL WORKSTATION**
- **ELECTRONIC TYPING**
- **COMMUNICATIONS**

Qualified candidates must have U.S. citizenship or be a registered alien.

TeamXEROX in Texas. It's our resources. Your resourceful mind. And a great place for both. Send your resume to: **Xerox Corporation, Information Products Division, MS 180, Dept. CW 4-23, 1341 W. Mockingbird Lane, Dallas, TX 75247.** Xerox is an affirmative action employer.

XEROX

FIELD ENGINEERS

Dataserv Computer Maintenance is expanding nationwide. We now have immediate openings in major cities and will be adding more in the near future.

These are key positions and provide excellent opportunities that will lead to further promotion in a fast growing company. Excellent compensation and good fringe benefits for experienced individuals. Your potential for personal advancement with a $100 million plus company is the greatest right now as we expand.

JACKSONVILLE, FLA - Field Engineer. Immediate opening for experienced Field Engineer for support of IBM 3200 Terminal Equipment.

OMAHA, NB - Field Engineer. Immediate opening for an experienced Field Engineer to service and maintain IBM large mainframe equipment, terminals and peripherals.

Dataserv will soon have additional opportunities for field engineers and technical specialists in several other major cities throughout the United States. If you are considering a change in employment, contact Dataserv for a review of what we have to offer.

For immediate consideration and more information call **Toll Free - 800-328-6729** or send your resume to: **Bev Walters, Dataserv Computer Maintenance, Inc., P.O. Box 3003, Hopkins, MN 55343.** We are an equal opportunity employer and all inquiries are considered confidential.

dataserv

NETWORK ADMINISTRATOR

UCSD - La Jolla, California

We are installing an electronic telephone system and a campus wide, local area network providing two cables for data and one for video transmission. The network administrator will have the responsibility for planning and administering local area network services. Our campus has over 10,000 employees and 13,000 students with an annual operating budget of over $400-million. The position requires a person with a strong record of success in the innovative design and implementation of a network of complex data communications and computer systems. Salary range: $41,100 - $49,704 annually plus excellent benefits. Applications/resumes must be received by May 8, 1984 at:

UCSD
University of California, San Diego

Staff Personnel Office
501 Warren Campus (14505-P) Q-016
La Jolla, CA 92093

EEO/AA Employer

SYSTEMS MANAGER

Multiple VAX-11/780s

GA Technologies Inc. is a broad based high technology firm located in beautiful San Diego, California.

We have an immediate need for a recognized expert on the DEC VAX/VMS computer and Data Communications software and hardware. Candidate will be responsible for configuring, installing and enhancing all VAX/VMS computer systems software. VAX systems are being used for engineering, business and office automation functions. Duties include developing enhancements to VMS and to office automation software.

Requirements include 5 years experience with at least 3 in configuring, enhancing, and maintaining VAX/VMS software on a multi-user computer system. Prefer BS or MS degree or equivalent work experience.

Please send your resume to GA Technologies Inc., Dept. MS, P.O. Box 85608, San Diego, CA 92138. We are an equal opportunity employer m/f/h/v.

GA Technologies

DIRECTOR - INFORMATION SYSTEMS

City Utilities is seeking a Director of Information Systems to manage a department of approximately 30 employees that includes Operations and Systems Development. Responsibilities include managing the Information Systems Department, developing the utility's overall requirements for computer systems and recommending the acquisition of hardware and software resources to support the utility's existing and future needs.

Qualifications include a bachelor's degree in computer science, business or a related field and 8 years progressively responsible experience with 5 years experience in a supervisory capacity. Advanced proficiency such as CDP or MBA is preferred.

Qualified applicants may send resumes to:

City Utilities
P.O. Box 551JS
Springfield, MO 65801
Attn: Carol Locke

EOE/M/F/H

SOFTWARE ENGINEERS

COMPUTER AIDED DESIGN
COMPUTER GRAPHICS
ANALOG DESIGN
PASCAL
FORTRAN

If you have at least one year experience in one or more of the above areas, our clients will want to talk with you.

Very attractive salary ranging from the 20s to 40s.

Send your resume to:

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Albany, NY 12207
518-463-6644

DIRECTOR OF PROGRAMMING

We are looking for an individual to head our professional staff. We are the largest media/marketing research on-line and batch processing company with offices in Europe, Asia, Australia, Canada, and North America. We have 3 DEC 2060 computers, and we'll soon acquire a 4th to serve our 500+ clients.

Individual must possess strong administrative, interpersonal and communication skills, and must have good technical skills, with solid grounding in Fortran. Past experience should include extensive work as project or group leader. Must have outstanding track record in project management and control.

If you are highly motivated, want a real challenge, and thrive in an intense environment, we can offer you a unique opportunity.
Send resume, in confidence, with salary history to:

CW-B4005
COMPUTERWORLD
Box 880, Framingham, MA 01701

Equal Opportunity Employer M/F

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HTS needs Customer engineers with IBM training and a minimum of 3-5 years experience in the following locations: Chicago, Pittsburgh, Cleveland, Akron. Exceptional compensation, complete benefits package. Send resume and salary requirements to:

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355 Beinoris Drive
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1-800-323-6355

COMPUTER INFORMATION SYSTEMS

Department chairperson, permanent position, tenure track, Master's degree required, college teaching experience preferred. To teach COBOL, BASIC, Systems Analysis Design and Methods, and related courses. Salary dependent upon qualifications. Send resume, transcripts, and references to Division Coordinator of Administrative and Consumer Services, William Woods College, Fulton, Missouri 65251 EOE.

SOFTWARE PROFESSIONALS TO $60K

UNIX KERNAL-C-X.25/SNA, ethernet compilers, graphics, communications. 3+ years experience operating systems. Degreed BSCS/BSEE. Urgent/Immediate Reply.

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Dorothy A. Plumb, P.E.
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or
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Many of our client companies in the Mountain States are looking for skilled computer professionals right now. Whether you're a Programmer looking to advance your career in Systems Analysis, or a Software Engineer seeking a position in sales, we can help you find the situation that is perfect for you. Virtually any type of computer position—in all kinds of computer environments—are available. A small sample is presented below.

Call Mike Withrow anytime, day or night, at 1-800-821-7700, extension 800B. As soon as we receive your inquiry, we'll get back to you with information about any position you wish to explore. Then, if you wish to pursue any opportunity further, we'll make all the arrangements without any cost or obligation to you. If you're unable to call, write:

Mike Withrow
Department C4
Source Edp
P.O. Box 7100
Mountain View, CA 94039

Arizona

Senior Programmer/Analyst — Banking Applications. Leading Arizona financial institution seeks a professional to assume responsibility for information center definition, planning, scheduling, resource management and final implementation. To **$33,000.**

Systems Analyst — System 38. Growing manufacturing firm in smaller Arizona community provides a ground-floor opportunity to build a staff and develop the data processing function. Proven leadership and technical skills including RPG II desired. Excellent opportunity. To **$31,000.**

Systems Analyst — New Corporate Subsidiary. Recently formed subsidiary of a prestigious Fortune 500 corporation seeks an Analyst to assist in the development of its first data processing systems. Solid background in COBOL, structured design techniques and previous system design responsibilities helpful. Phoenix location. To **$33,000.**

Unix/C Systems Programmer. Phoenix based firm seeks an individual with extensive Unix/C software background to assume complete responsibility for system integrity, performance, generation and maintenance. Knowledge of minicomputers in a distributed processing environment preferred. To **$34,000.**

Systems Engineer — Dual Career Path. Computer hardware vendor who ranks among the leaders in Distributed Data Communications seeks an Analyst to join its Phoenix office staff. Knowledge of several high level languages, data communications concepts and minicomputers is desired. To **$38,000.**

Micro Systems Programmer. Prestigious computer hardware manufacturer seeks an experienced real-time Programmer/Analyst to participate in the development of applications for small aerospace industries. Extensive Assembler and PASCAL, C, engineering orientation and excellent oral/written communication skills required. Southern Arizona location. To **$36,000.**

Senior MVS And IMS Systems Programmers. Nationally known Phoenix organization offers challenging position with responsibility for MVS and IMS performance evaluation, hardware evaluation and planning, extensive TP network design and training of junior staff members. To **$40,000.**

Operations Analyst — Distributed Processing. Phoenix area organization seeks a professional to analyze corporate operations to determine new operating center locations and develop techniques to enhance existing systems. Background should include business degree and operations management experience. To **$34,000.**

RPG II Programmer Growing Arizona organization seeks a professional with solid RPG programming skills to assist in financial and inventory development. Broad business applications exposure preferred. To **$25,000.**

Programmers — HP3000. Major Arizona organization is beginning the implementation of HP 3000-based distributed information systems. It offers outstanding internal training opportunities in a recession-proof industry. To **$30,000.**

Minicomputer Specialists. Communications firm has multiple projects for mini/micro Programmers and Software Engineers to develop state-of-the-art communications based systems on microcomputers as front-end vehicles to handle line traffic and support multipurpose communications networks. B.S., MS degree. To **$40,000.**

Systems Analyst — Distribution or Financial. Major division of a Fortune 500 corporation seeks an experienced Analyst with at least three years experience in distribution and/or financial information systems. Large systems environment exposure preferred. Arizona location. To **$38,000.**

ALC Programmer/Analyst. Corporate Data Communications Group of a Phoenix-based Fortune 500 company seeks an individual to participate in the development of sophisticated remote teleprocessing systems using VTAM, CICS, IMS/DC and IB 3033's under MVS. Company offers extensive formal training. To **$33,000.**

Business Systems Analyst/Manager Fast-growing diversified Phoenix company in the financial field seeks an individual to manage staff of five analysts and all business development, planning and research. Position reports directly to MIS Director. To **$50,000 plus bonus and profit sharing.**

Systems Manager — On-Line Development. Suburban Phoenix organization offers an exceptional opportunity for a professional with previous project management experience to direct the development of new on-line financial systems. Strong project control techniques and communication skills required. Prefer distributed systems experience. To **$34,000.**

New Mexico

Scientific Programmer. New Mexico firm seeks aggressive, technically-oriented individual with expertise in mathematical analysis and simulations. B.S. degree, DEC, VAX and FORTRAN experience sought. To **$30,000, M.S. degree to $35,000.**

CICS Programmer/Analyst. New development in 1984 requires three new staff members. COBOL and one year CICS experience helpful. To **$26,000.**

Junior Programmer/Analyst. Progressive New Mexico OS shop offers an exceptional opportunity in the development of on-line administrative systems. Will consider one year experience with COBOL or Assembler Language. To **$23,000.**

Lead Systems Programmer. Leading New Mexico firm has created a new position requiring expertise in project management, standards development, hardware/software evaluation and systems tuning, 370/OS/VS/VM. To **$38,000.**

DEC Systems Engineer — Minis. Leading communications firm seeks a Systems Engineer with strong Assembler and data communications experience on DEC RSX or VAX systems. To **$35,000.**

Engineering Analyst. High technology New Mexico-based firm seeks an Engineering Programmer with strong background in Analytical problem solving (prefer PHD, MS Engineers) with FORTRAN, minicomputers and graphics. Degree in Engineering preferred. To **$40,000.**

Colorado

Sales Representative — Denver Branch Expansion. Leading computer service firm needs Sales Representative with a successful track record in computer-oriented sales. Opening due to promotion. Package To **$80,000.**

Programmer/IMS/CICS Training. International financial organization in midst of expansion seeks two years OS/COBOL experience plus CICS or IMS. Training provided in either CICS or IMS. Knowledge of structural techniques helpful. To **$34,000.**

Defense Modeling Analysts — New Colorado Springs Office. New division of major defense consulting firm seeks Systems Analysts with three years FORTRAN programming experience with defense modeling applications. Multiple openings. Project Leader opportunities. To **$48,000.**

Miniprogrammer — New Applications Development. National minicomputer manufacturer, beginning a new major applications development effort, seeks a professional with three years experience developing on-line business applications in BASIC. To **$36,000.**

Customer Applications Analyst — Time-sharing. Denver-based time-sharing firm is expanding its branch staff and seeks persons with two years of FORTRAN or BASIC exposure involving engineering or business applications. To **$28,000.**

Programmer/Analyst — Formal Training. International computer hardware manufacturer has multiple openings for Programmer/Analysts with a minimum of two years COBOL on IBM, OS or DEC environments. This Fortune 500 company has an excellent internal training program. To **$35,000.**

Systems Programmer — New Systems Group. Growing Denver suburban firm seeks their first MVS Systems Programmer. Will train the right person with an IBM OS/CICS Systems background To **$40,000.**

Programmer/Analyst — New IMS Development. Headquarters of a major division of an international firm moving into a new Denver data center seeks a professional with two years OS/COBOL experience. Knowledge of IMS preferred. Will be assigned to extensive new systems development projects. To **$32,000.**

Sales Representatives — Time-sharing. Highly-respected national computer services firm with well-established Colorado customer base seeks marketing professionals having at least one year experience in any DP sales activity. **Anticipated first year earnings To $50,000.**

COBOL Programmer — New Development. Prestigious firm offers an excellent working environment, outstanding benefits and good career growth including a 90-day salary review. One year of COBOL applications experience and preferably, knowledge of packaged G/L systems and HP3000 sought. To **$26,000.**

Sales — Denver Branch Expansion. International services firm seeks a seasoned computer sales executive with a strong technical background and sales management experience. Position involves management of new sales staff in Denver. To **$50,000.**

Programmer/Analyst — International Travel. Software consulting firm with an international client base seeks a marketing-oriented Programmer with two years RPG II or III experience. Some travel provided as member of a support team. Denver location. To **$32,000.**

UNIX "C" Programmer/Analyst — Boulder Location. Exciting new opportunity exists in systems development for a professional with two years UNIX and "C" experience. To **$54,000.**

Systems Analyst — Banking. New electronic banking department of a large Denver bank is automating various manual systems and seeks a professional with bank operations knowledge and programming background to work with user departments. To **$40,000.**

Real-Time Programmer/Analyst. National software development consulting firm in beautiful Colorado Springs seeks a professional with solid FORTRAN experience combined with any Assembler real-time applications programming exposure, preferably on CDC hardware. To **$35,000.**

Utah

COBOL Programmer/Analyst — International Firm. Prestigious corporation with a worldwide customer base seeks an experienced DEC COBOL Programmer/Analyst. VAX or manufacturing experience is desirable. To **$30,000.**

RPG II Programmer/Analyst. High tech company based in Salt Lake seeks an experienced RPG II, HP3000 Programmer to assist with a conversion of manufacturing applications to an HP3000. To **$30,000.**

Programmer/Analyst — IMS. International financial firm with new data center in Salt Lake seeks professional with two years OS/COBOL plus IMS DB/DC. Offers full relocation package. Ground floor opportunity. To **$37,000.**

Micro Processor Specialist. International manufacturing company has immediate needs for professionals with assembly backgrounds on Z-80 or 8080-based architecture. Participate in the design and development of new and sophisticated aviation navigation systems. Full relocation. To **$40,000.**

CICS Systems Programmer. Stable and established Salt Lake organization is in need of a Systems Programmer to install and maintain CICS on Amdahl mainframe. To **$32,000.**

Entry-Level Systems Programmer. Excellent opportunity for sharp, technically oriented Programmer with some IBM Assembly background to move into a Systems Programmer position. Company will train in OS/MVS, NCP, SNA, ACF and VTAM. To **$35,000.**

Senior Engineering Analyst. Leading firm in real-time process control and material handling systems seeks a degreed professional with one-to-six years of software experience on PDP-11/RSX 11-M or IBM Series-1. Excellent opportunity to use military or aerospace background and move to private industry. Salt Lake City location. To **$34,000.**

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POSITION ANNOUNCEMENTS | POSITION ANNOUNCEMENTS | POSITION ANNOUNCEMENTS | POSITION ANNOUNCEMENTS | POSITION ANNOUNCEMENTS

EDP Professionals

Middle South Services has one of the South's largest data processing centers serving one of the nation's largest power systems. Middle South Utilities, our parent company, is a major electric utility. Our hardware environment includes two IBM 3081s, and IBM 4341 and Tandem mini 16s. If you are a career-minded EDP professional, we have the following opportunities available:

SENIOR SYSTEMS ANALYST A current opening exists for an experienced Systems Analyst to provide development and support of the Materials Management Systems in the Power Plant and Materials Section of our Management Systems Department. The ideal candidate will have a minimum of 5 years experience in program development, production support and test coordination on the IBM mainframe including knowledge of report writers or high level languages such as MARK IV, EASYTRIEVE, FOCUS and/or RAMIS-II. IMS DB/DC experience is a must as well as the ability to direct the work efforts of others. Previous applications experience in material tracking, bills of material, financial systems, manufacturing systems and/or engineering design interface is preferred but not required.

(C.I.C.S.) SYSTEMS PROGRAMMER The selected individual will assume responsibility for our C.I.C.S. "internals". A BS in Computer Science or equivalent experience required. Must have experience in a large scale MVS environment with large scale C.I.C.S. in a tech support role. Will be responsible for TABLE GENS-SYSGENS, performance and tuning, problem determination on C.I.C.S. plus MVS dump analysis. Will work with on-line monitors and batch reporting systems. Experience with resolve/C.I.C.S., control/C.I.C.S., ALC programs, and PL-1 or COBOL a plus. Application interface helpful.

ANALYST/PROGRAMMERS (APPLICATIONS)
Several positions are currently open for experienced IMS DB/DC Analyst Programmers. Experience with COBOL or PL-1 in plant maintenance or business applications is needed.

ANALYST PROGRAMMERS (SCIENTIFIC) Requires previous experience in scientific applications with a sound knowledge of PL-1 or Fortran. Computer applications development with exposure to a VM operating system would be helpful.

Due to our size and scope of operation, we offer access for advancement, career stability and an excellent salary with major benefits. For more information, call our number below or to apply directly, send your confidential resume to **Byron Heath or Richard Jackson, MIDDLE SOUTH SERVICES, INC., P.O. BOX 61000, NEW ORLEANS, LA 70161.**

1-800-231-4481
In Louisiana, call collect (504) 569-4960.

MIDDLE SOUTH SERVICES INC.
An Equal Opportunity Employer M/F

CAD/CAM Specialist

Start-up opportunity

General Electric Capacitor Products Department in upstate New York offers key responsibility for establishing a state-of-the-art CAD/CAM facility for the manufacture of electronic capacitors.

The scope

You'll be integrating CAD/CAM capabilities into the design and manufacture of electronic capacitors with specific responsibility for installing and maintaining CAD/CAM software and for providing user training and guidance on software applications.

Qualifications

BS in Computer Science, Engineering or Math with 2-3 years experience in Mechanical CAD programming. CALMA experience preferred.

It all adds up

The company, the opportunity and the location...a small-town vacation area with year-round opportunity for outdoor living and recreation. Yet we're within driving range of several major cities. To learn more about responsibilities, compensation/benefits, send resume with salary history to: **Mr. Douglas G. Rocque, Ref. 48-T, General Electric Company, Capacitor Products Department, John Street, Hudson Falls, NY 12839.**

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air new zealand

ACP/IPARS

At the Air New Zealand Computer Centre in Auckland, we are planning further development to our Reservations and Traffic Handling systems.

If you are a project-oriented DP professional, with ACP or IPARS experience, this is your opportunity to join our enthusiastic and dedicated systems team.

We will offer you -

- A technically stimulating and motivating working environment.
- An opportunity for personal achievement within the varied aspects of our operations.
- A competitive salary with optional subsidised pension scheme and attractive airline benefits.
- Generous relocation assistance.
- A chance to live and work in a beautiful country with the tropical South Pacific islands at your doorstep.

INTERESTED? then please send your resume, or write for more information to:

Manager Personnel Department
Air New Zealand
Private Bag,
AUCKLAND, NEW ZEALAND

SYSTEMS ANALYSTS

Do you like non-routine assignments, creative problem solving, working with top-notch professionals on meaningful projects? If so, ICI may be worth your consideration. We are seeking well qualified achievers for these positions in our dynamic corporate MIS Department:

Systems Programmer—3 or more years' MVS systems programming experience including maintenance of operating systems, MVS-related program products and IBM program products such as SM/1, PL/1 and COBOL. IBM 3081 environment moving to MVS/XA.

Sr. Data Base Analyst—5+ years' data processing experience with in-depth knowledge of one or more data base management systems and a working familiarity with data dictionary products.

Data Base Analyst—3 or more years' data processing experience with a working knowledge of IMS DB/DC and either COBOL or assembler, as well as IMS backup/recovery utilities.

Sr. Systems Analyst—5+ years' experience in the design and implementation of manufacturing financial or marketing systems in a large IBM mainframe environment. Experience in MRP II is a plus.

Sr. Scientific Programmer/Analyst—3+ years' experience in a DEC environment (VAX, PDP 11/70, VMS, RSX11M and Fortran). A biomedical research or instrumentation background is a plus.

ICI Americas (sales of over one billion in '83) is the U.S. subsidiary of a major multi-national corporation. These positions are located at our corporate headquarters, a campus like complex in suburban Wilmington, DE. ICI offers salaries fully commensurate with the required experience, excellent benefits including a generous relocation policy and ample growth opportunities. Delaware, "the small wonder" state, offers cosmopolitan living without the high costs and other drawbacks of big city living. Why not invest 20 cents in your future by sending your resume including salary in confidence to:

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Wilmington, DE 19897

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Charlotte, NC 28210
704/554-1101

INFORMATION CENTER MANAGER

Immediate and challenging opportunity in a growing computer environment for a Manager of the Computer Information Center at the University of Nebraska Medical Center. Individual will be responsible for planning and coordinating the teaching and consultation of micro and main frame products. Bachelor's degree with a minimum of 5 years of experience in data processing is required. Demonstrated responsibility in providing training and technical support to end-users, including microcomputer selection, programming, analysis and statistical package use. Successful applicant must demonstrate good communication skills. An advanced degree with information center experience is preferred. Qualified candidates may submit a resume and letter of introduction to:

University of Nebraska Medical Center
619 S. 42nd Street
Omaha, NE 68105

An Equal Opportunity Employer M/F/H/V

DP POSITIONS SEATTLE/PORTLAND

MVS. Sr. Systems Programmer	$42K
Sr. IMS Systems Prog. Systems Performance-data base consultant to applications group.	42K
Sr. Programmer/Analyst Financial app. CICS/DL1 on line interactive.	32K
Programmer/Analyst CICS/DL1 or VSAM on-line dev.	28K
Sr. P/A IMS applications dev	to 40K
Data Admin. Analyst data resources Mgmt local DP design.	to 45K

Please forward resume immediately to:

HOUSER, MARTIN MORRIS & ASSOC.
(206) 453-2700
C-90015, 1940-116th Ave. N.E.
Bellevue, WA 98009

Assistant Director

Responsible for planning, development, and installation of administrative systems. B.S. + 5 years experience managing DP activities required. Advanced degree, experience in higher education desirable.

Quality benefits package. Salary commensurate with qualifications. Start date June 1 or thereafter. Applications including resume by May 10 to:

John B. McManus, Director
Urbana-Champaign Office of Administration
Information Systems and Services
54 Administration Building
University of Illinois
Urbana, Illinois 61801
217/333-4820
AA/EOE

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ASSISTANT DIRECTOR OF THE COMPUTER CENTER

USER SERVICES

Canisius College seeks a person responsible for faculty, administrator and student consulting support in the use of applications packages and programming languages. Strong communications skills required. Masters degree in computer related field, VAX VMS, microcomputer experience preferred. Salary commensurate with experience and qualifications. Excellent tuition benefits for self/dependents. Send resume and salary requirements by May 1, 1984 to Joel A. Cohen, Computer Center Director, Canisius College, Buffalo, NY 14208. An Equal Opportunity Employer M/F.

MIS OPPORTUNITIES

Perkins Restaurants, Inc., a wholly owned subsidiary of Holiday Inns, Inc., has relocated its corporate headquarters to Memphis, TN. We are seeking aggressive, growth-oriented professionals to fill key positions in our Data Processing Department. Our installation is IBM 4341-L2 running VM/CMS and DOS/VSE. Our development emphasis is on new on-line applications utilizing CICS.

SENIOR PROGRAMMER ANALYST
3-5 years experience supported by strong financial/accounting systems, COBOL, DOS and software package installation, particularly MSA. Knowledge of SPF and CICS helpful; degree preferred.

PROGRAMMER ANALYST
2-4 years experience supported by strong financial/accounting systems, COBOL and DOS. Knowledge of SPF, CICS, and RPG helpful; degree preferred.

Perkins offers a very attractive compensation and benefits package and excellent career growth opportunities. For immediate, confidential consideration, please forward resume and salary requirements to: **Perkins Restaurants, Inc., 6401 Poplar Ave., Suite 600, Memphis, TN 38119, ATTN: C.W. Stewart**

An Equal Opportunity Employer.

Perkins Restaurants
a wholly owned subsidiary of Holiday Inn

FACULTY POSITIONS COMPUTER SCIENCE/ MATHEMATICS

Two positions in Computer Science are available in the Mathematics and Computer Science Department for the Fall semester of 1984. One of the openings is a tenure track position. Applicants must have at least a Master's degree in Computer Science and be prepared to enroll in a Ph.D. program. Preference will be given to candidates with a Ph.D. in Computer Science or in a related discipline. Appointments will be made at the Assistant or Associate Professor rank commensurate with experience. Teaching responsibilities will include upper-level undergraduate courses in computer science, along with traditional introductory and service courses. Applicants should have strengths in operating systems, networking, artificial intelligence and/or computer architecture. Newly acquired academic computing equipment includes IBM 4361, VAX 11/750, VAX 11/730 and 50 DEC Rainbow systems.

Millersville University is the oldest of the 14 universities of the Pennsylvania State System of Higher Education. The campus is located in a suburb of historic Lancaster, oldest inland city in the U.S. Located less than three hours from New York City, Washington, D.C., and Philadelphia, it offers a pleasant atmosphere with easy access to the Jersey shore and the Pocono resorts. The department has 26 full-time faculty and offers a B.S. in Computer Science as well as B.A. and B.S. degrees in Mathematics. Teaching load is 12 hours with an average class size of 30 students.

Interested applicants should submit a resume showing education and experience, transcripts of all graduate and undergraduate courses, and three letters of reference to: Dr. James A. Stager, Chairperson, Department of Mathematics and Computer Science, MILLERSVILLE UNIVERSITY, Millersville, PA 17551. Interviews will begin immediately and continue until suitable candidates are selected. Millersville earnestly seeks and is eager to receive applications from women and minority candidates. Affirmative Action/Equal Opportunity Employer.

PROGRAMMER ANALYSTS / PROJECT LEADERS / SYSTEMS ANALYSTS

Help CGA set the standard in consulting.

Over the last 15 years, CGA has acquired a solid reputation as the number one DP consulting firm in the country. We've built that reputation by insisting on the highest standards of integrity, achievement and technical excellence.

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We're looking, specifically, for programmer analysts, project leaders and systems analysts with skills in the following areas:

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CGA CONSULTING OFFICES

Northeast
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Cranford, NJ 07016
(201) 272-7950

Marjorie S. Linn
369 Lexington Avenue
New York, NY 10017
(212) 883-0900

Central
Joni Kreitzer
212 West National Road
Vandalia, OH 45377
(513) 890-1200

Mid-Atlantic
JoAnn Russo
111 Presidential Boulevard
Bala Cynwyd, PA 19004
(215) 668-4626

Peter McElhinney
1501 Santa Rosa Road
Richmond, VA 23288
(804) 288-1422

Jack McFarland
401 East Pratt Street
World Trade Center
Baltimore, MD 21202
(301) 837-0343

Micki Popp
White Flint Mall
11301 Rockville Pike
North Bethesda, MD 20895
(301) 231-7850

Midwest
Mary Liner
Arbor Terrace II
205 Bishops Way
Suite 206
Brookfield, WI 53005
(414) 784-9337

Steve Grunkmeyer
1011 East Touhy Avenue
Des Plaines, IL 60018
(312) 296-9660

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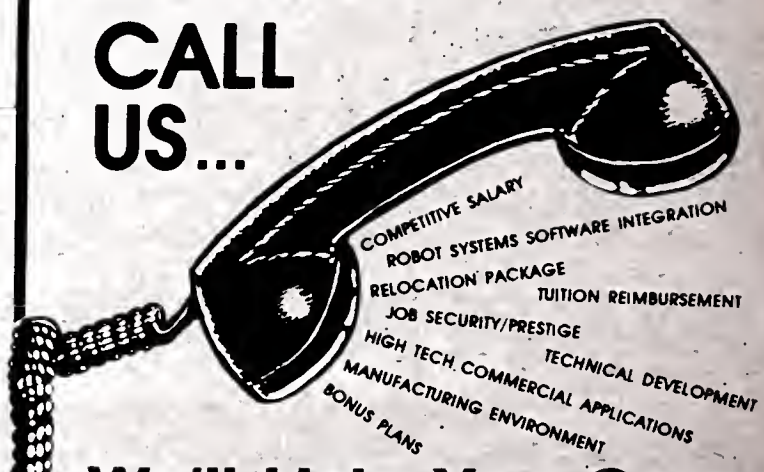

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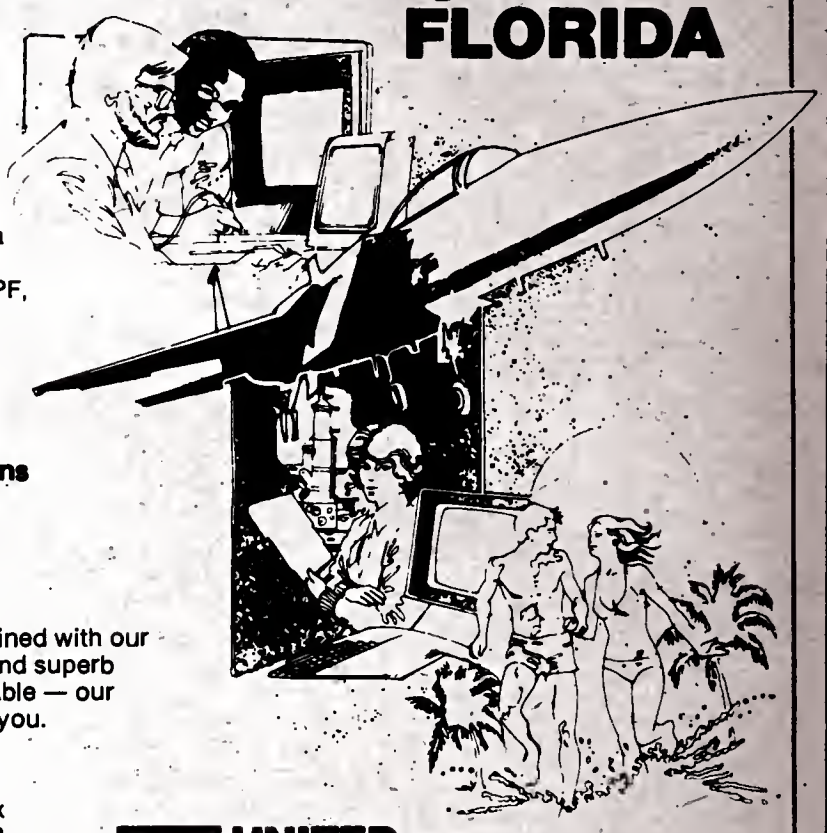

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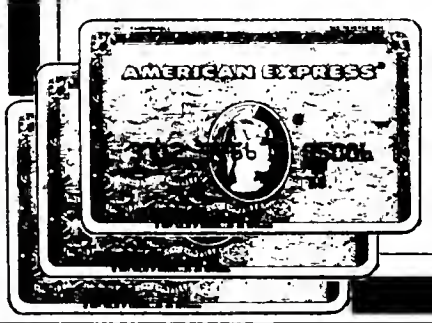

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K's Merchandise Mart, Inc., a growing central Illinois catalog showroom retailer seeks an individual to manage and maintain business applications on a NCR 8575 System. The ideal candidate will be an experienced systems analyst or computer department manager using NCR hardware in an on-line environment, having hands-on experience with COBOL, NEAT 3, BOSS 3, and PLUS 4. Responsibilities include supervising a staff of eight, software development, software maintenance, and hardware selection. The individual must possess management, technical and communications skills and be self-motivated. We offer a competitive salary and fringe benefits. Please send resume with salary history in confidence to:

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Established in 1981, the Institute's objective is to promote the rapid development of leading edge computerization both in the public and private sectors, and to participate in the development of Singapore as a regional center for software and devlopment and services. Technical leadership is exerted through quality management education, advanced technical training, consulting services and applied research. ISS has excellent educational and computer facilities.

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One Harkness Plaza
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or: THE DIRECTOR,
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Data Processing

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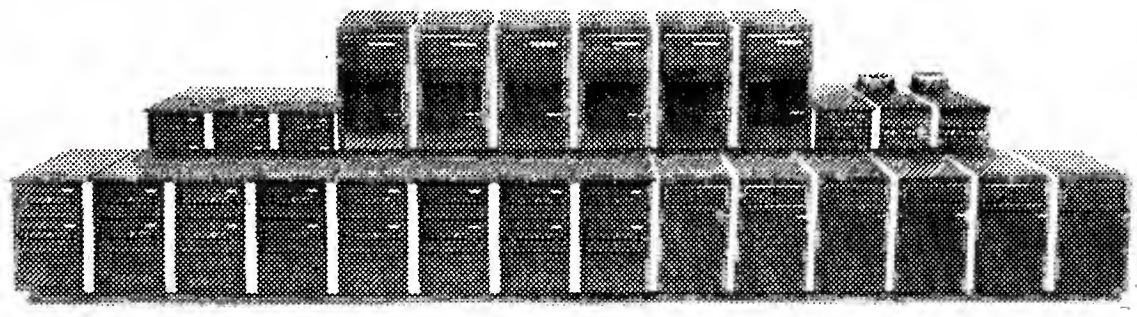

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PROGRAMMING

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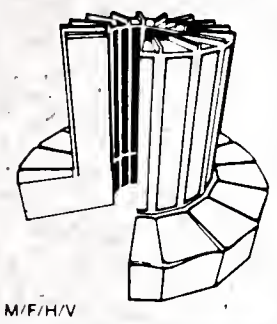

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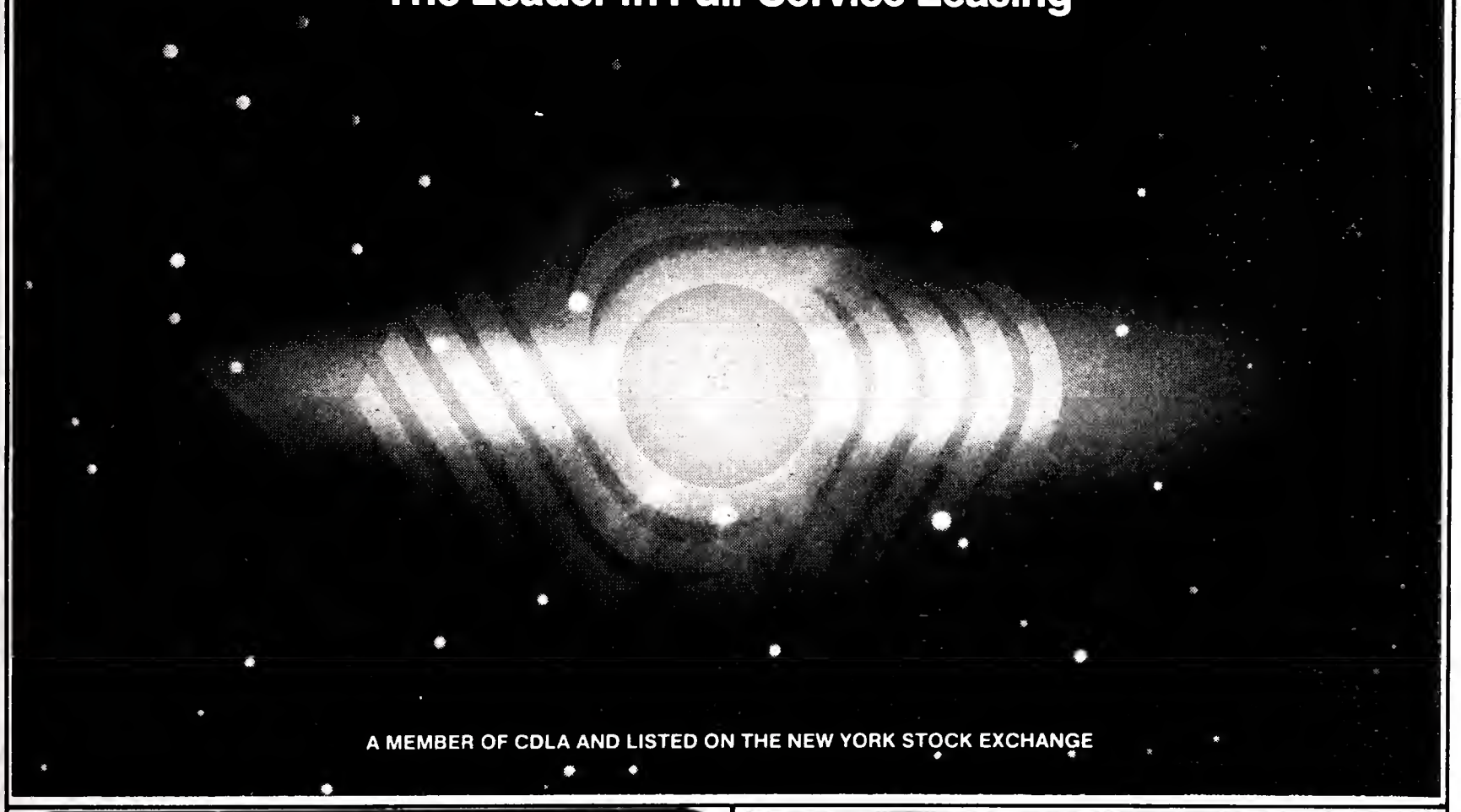

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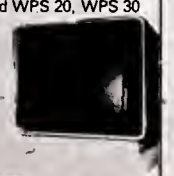

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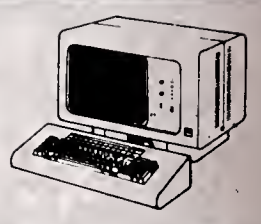

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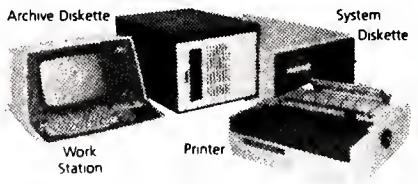

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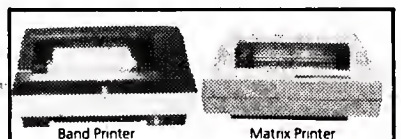

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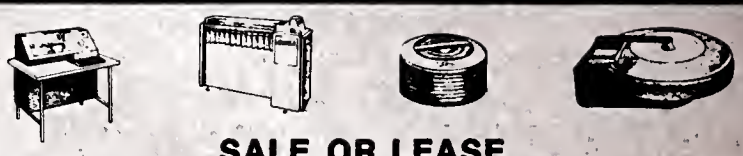

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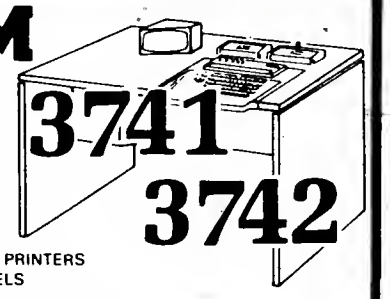

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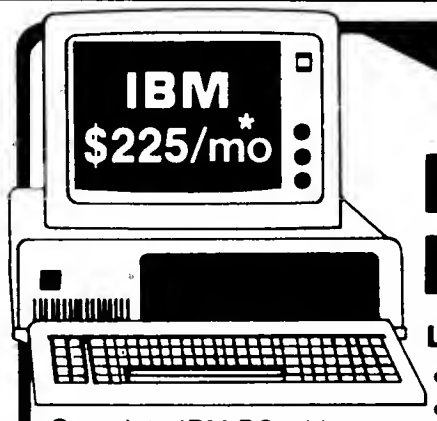

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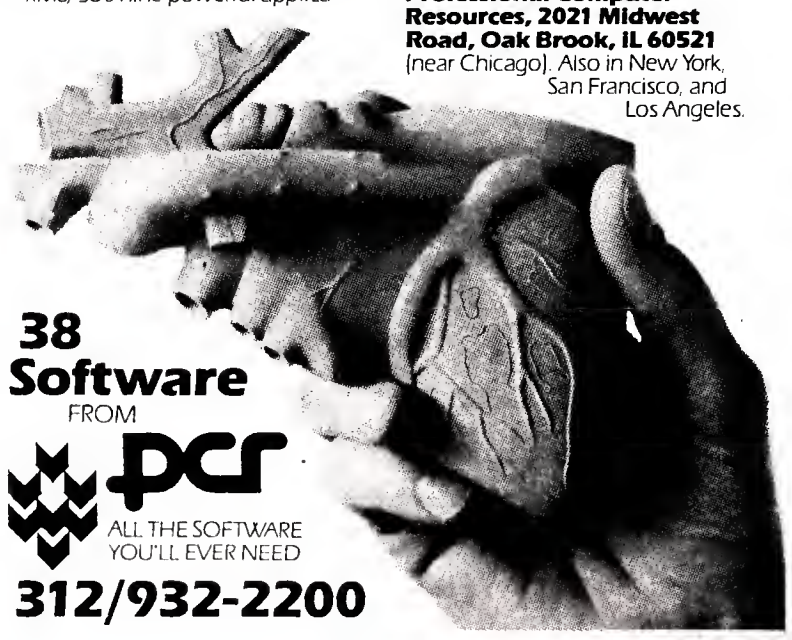

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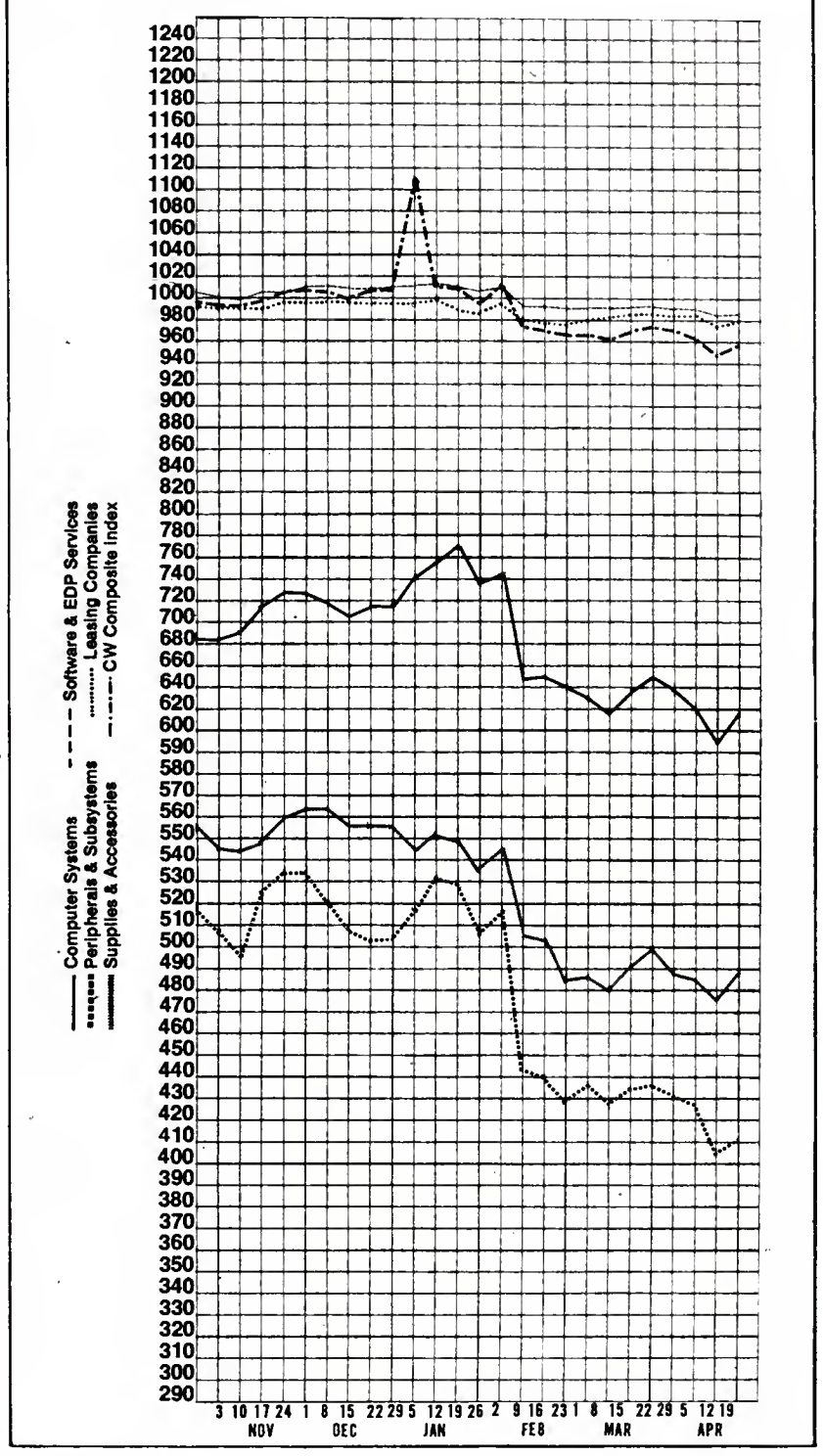

Computerworld Stock Trading Summary

TRADE QUOTES

CLOSING PRICES WEDNESDAY, APRIL 18

All statistics compiled, computed and formatted by TRADE QUOTES, INC Cambridge, Mass. 02139

EXCH		1983-84 RANGE (1)	CLOSE APR 18 1984	WEEK NET CHNGE	WEEK PCT CHNGE
	COMPUTER SYSTEMS				
O	ALPHA MICROSYSTEMS	11- 24	12 3/4	+ 1/2	+4.0
O	ALTOS COMPUTER SYST	8- 28	10 1/2	- 1/4	-2.3
A	AMDAHL CORP	9- 30	13 7/8	+1	+7.7
O	APPLE COMPUTER INC	18- 63	28	+3 1/2	+14.2
N	AT&T	15- 70	15 1/4	- 3/4	-4.6
N	BURROUGHS CORP	28- 58	50 1/4	+1 3/4	+3.6
O	COMPUTER AUTOMATION	6- 17	7 1/4	- 1/2	-6.4
A	COMPUTER CONSOLES	8- 26	17 1/8	+1 3/8	+8.7
N	CONTROL DATA CORP	21- 62	30	-3 1/8	-9.4
O	CONVERGENT TECHNOL	13- 41	13 7/8	+ 3/8	+2.7
N	CRAY RESEARCH INC	20- 58	40	+1 1/2	+3.8
N	DATA GENERAL CORP	10- 48	46	+3 3/4	+8.8
N	DATAPOINT CORP	11- 36	22 3/8	+ 7/8	+4.0
N	DIGITAL EQUIPMENT	62-132	89 1/2	- 1/2	-0.5
A	EECO INC	6- 16	14 7/8	+ 3/4	+5.3
N	ELECTRONIC ASSOC.	5- 15	5 3/8	+ 1/8	+2.3
N	FLOATING POINT SYST	13- 44	16 5/8	+ 1/4	+1.5
N	FOXBORO	22- 47	31 5/8	+2	+8.7
O	GENERAL AUTOMATION	3- 16	10 5/8	+1 1/4	+13.3
N	GOULD INC	28- 44	28 1/4	+1	+3.6
N	HARRIS CORP	20- 51	30 3/4	+1 1/2	+5.1
N	HEWLETT-PACKARD CO	22- 48	34 3/8	+1 1/8	+3.3
N	HONEYWELL INC	28- 69	55 5/8	+1 3/4	+3.2
N	IBM	57-134	111 1/8	+2 1/4	+2.0
O	IPL SYSTEMS INC	4- 14	4 1/4	- 1/4	-5.5
N	M/A-COM INC	13- 35	16	+2	+14.2
O	MAGNUSON COMP SYSTS	1- 5	3/8	0	0.0
N	MANAGEMENT ASSIST	7- 28	23 3/4	+ 1/4	+1.0
N	MATSUSHITA ELEC(ADR)	47- 88	84 1/2	-1 1/2	-1.7
N	MODULAR COMPUTER SYS	6- 18	7 1/4	+ 1/2	+7.4
N	MOHAWK DATA SCI	9- 19	11 5/8	+1 1/8	+10.7
N	MOTOROLA INC	82-148	115 3/4	+5 1/8	+4.8
N	NAT'L SEMICONDUCTOR	13- 80	14	+ 3/4	+5.6
N	NBI INC	17- 51	21 1/8	+2 1/8	+11.1
N	NCR	39-136	99 1/4	+ 1/2	+0.5
N	PERKIN-ELMER	17- 37	27	+1 1/8	+4.3
N	PRIME COMPUTER INC	11- 30	15 1/2	+1	+8.8
N	SPERRY CORP	21- 50	38 7/8	+2 1/4	+8.1
O	TANDEM COMPUTERS INC	14- 40	20	+3	+17.6
N	TANDY CORP	31- 85	34 7/8	+1 1/4	+3.7
O	TELEVIDEO SYSTEMS	11- 41	11 3/8	-1 1/8	-9.0
O	TELXON CORP	8- 18	9	+ 1/2	+5.8
N	TEXAS INSTRUMENTS	71-176	138 3/8	+8 3/8	+6.5
A	ULTIMATE CORP	8- 24	18 1/4	+1	+5.7
O	VECTOR GRAPHICS INC	2- 14	1 1/2	- 1/8	-7.6
A	WANG LABS "B"	13- 42	26 7/8	+3 1/4	+13.7
A	WANG LABS "C"	11- 42	27 1/4	+3 1/4	+13.5
N	XEROX CORP	35- 52	39 3/4	+ 1/4	+0.6
	LEASING COMPANIES				
O	BOOTHE FINANCIAL CP	11- 42	38 1/2	+1	+2.6
N	COMDISCO INC	7- 42	11 1/4	0	0.0
O	CONTINENTAL INFO SYS	3- 16	7	+ 1/4	+3.7
N	DPF INC	5- 15	12	- 1/8	-1.0
O	SELECTERM INC	11- 21	11	+ 1/4	+2.3
N	U.S. LEASING	18- 47	30 3/4	0	0.0
	COMPONENTS				
N	ADVANCED MICRO DEV	13- 37	32 1/8	+3 1/2	+12.2
O	ADV'D SEMICONDUCTOR	12- 38	23 1/4	+ 1/2	+2.1
N	ANALOG DEVICES INC	14- 32	20 5/8	+ 7/8	+4.3
O	ANALOGIC CORP	14- 27	14 1/2	0	0.0
N	APPLIED MAGNETICS CP	15- 37	17 3/8	+1	+6.1
N	TERADYNE	14- 39	26 1/4	+ 3/8	+1.4

EXCH: N=NEW YORK; A=AMERICAN; P=PACIFIC; B=BOSTON; L=NATIONAL; M=MIDWEST; O=OVER-THE-COUNTER
O-T-C PRICES ARE BID PRICES AS OF 3 P.M. OR LAST BID
(1) TO NEAREST DOLLAR

EXCH		1983-84 RANGE (1)	CLOSE APR 18 1984	WEEK NET CHNGE	WEEK PCT CHNGE
	SOFTWARE & EDP SERVICES				
O	ADVANCED COMP TECH	1- 8	3	+ 1/4	+9.0
O	ADVANCED SYSTEMS INC	6- 22	16 1/4	- 1/8	-0.7
O	AGS COMPUTERS INC	7- 32	19 3/4	+2 1/2	+14.4
O	AMERICAN SOFTWARE	14- 31	14 1/2	0	0.0
N	ANACOMP INC	3- 23	2 5/8	+ 1/8	+5.0
O	ANALYSTS INTL CORP	5- 20	6	+ 1/2	+9.0
A	APPLIED DATA RES.	8- 37	19	0	0.0
O	ASK COMPUTER SYSTEMS	6- 21	15 1/4	+1 1/2	+10.9
B	ASTRODYNE COMP IND	1- 7	1 3/4	+ 1/8	+7.8
N	AUTOMATIC DATA PROC	21- 44	31	+ 1/2	+1.6
O	CGA COMPUTER ASSOC	5- 17	10 1/8	+ 1/2	+5.1
O	COMPUTER ASSOC INT'L	6- 35	18	+ 1/4	+1.4
O	COMPUTER HORIZONS	8- 20	12	- 3/4	-5.8
O	COMPUTER NETWORK	4- 10	5 1/2	- 1/8	-2.2
N	COMPUTER SCIENCES	11- 23	14 5/8	- 1/8	-0.8
O	COMPUTER TASK GROUP	8- 22	14 1/4	+ 1/2	+3.6
O	COMPUTER USAGE	2- 22	6 3/4	+ 1/4	+3.8
O	COMPUTONE SYSTEMS	5- 38	5 1/2	+ 1/8	+2.3
O	COMSERV CORP	4- 20	4 5/8	- 1/8	-2.6
O	COMSHARE	7- 14	7 1/2	- 5/8	-7.8
N	CULLINET SOFTWARE	12- 50	26 1/2	-2 1/4	-7.8
O	CYCARE SYSTEMS INC	9- 27	16 1/2	0	0.0
N	ELECTRONIC DATA SYST	10- 42	28 1/2	+2 1/2	+9.6
O	HOGAN SYSTEM INC	14- 27	14 3/4	+ 1/4	+1.7
N	GENERAL ELECTRIC CO	45- 59	54 1/2	+2 5/8	+5.0
N	GTE CORP	36- 48	38 1/4	+1	+2.6
N	INFORMATICS INC	10- 34	19 5/8	+ 1/4	+1.2
O	INFOTRON SYSTEMS COR	25- 43	29	+1	+3.5
O	KEANE ASSOCIATES	4- 15	7 1/4	0	0.0
A	LOGICON	8- 31	20 1/2	+1 5/8	+8.6
O	MCI COMMUNICATIONS	8- 34	8 1/8	- 1/8	-1.5
O	MNGT SCI AMER INC	8- 33	17 1/2	+ 3/4	+4.4
O	MATHEMATICAL APP GRP	8- 22	7 1/2	- 1/2	-6.2
O	MICOM SYSTEMS INC	25- 50	33 1/2	+1 1/2	+4.8
O	MONCHIK-WEBER CP	6- 22	8 1/4	0	0.0
O	NATIONAL DATA CORP	5- 26	18 1/4	+ 7/8	+5.0
O	ON-LINE SOFTWARE INT	8- 27	11 1/2	+ 1/2	+4.5
O	PANSOPHIC SYSTEMS	8- 30	11 7/8	+ 1/8	+1.0
N	PLANNING RESEARCH	6- 21	14 1/4	+2	+16.3
O	POLICY MGMT SYSTS CP	15- 35	26	+3 1/4	+14.2
O	PROGRAMMING & SYS	1- 8	4 1/2	0	0.0
O	REYNOLDS & REYNOLD	17- 53	30 3/4	+ 3/4	+2.5
O	GE1 CORP	11- 34	14 3/4	- 1/4	-1.6
O	SHARED MEDICAL SYST	13- 43	27 1/4	+1 1/2	+5.8
O	SCIENTIFIC COMPUTERS	6- 14	8 1/2	+ 1/2	+8.2
O	SOFTWARE AG	5- 17	11 1/2	- 7/8	-6.1
N	TYMSHARE INC	12- 30	25	0	0.0
A	URS CORP	5- 18	11 5/8	- 1/4	-2.1
N	WYLY CORP	7- 17	10 1/2	- 1/8	-1.1
	PERIPHERALS & SUBSYSTEMS				
P	AM INTERNATIONAL	2- 7	2 3/4	- 1/8	-4.3
A	ANDERSON JACOBSON	7- 26	8	+ 1/8	+1.5
O	AUTO-TROL TECHNOLOGY	8- 29	13 1/2	-2 1/2	-15.6
O	BANCTEC INC	7- 33	8 1/4	+ 1/4	+3.1
A	BEEHIVE INT'L	4- 15	5 5/8	- 1/8	-2.1
N	BOLT,BERANEK & NEW	5- 30	19	+1 5/8	+9.3
O	CAMBEX CORP	1- 4	1 3/8	0	0.0
N	CENTRONICS DATA COMP	6- 28	11 3/8	+ 3/4	+7.0
A	CETEC CORP	4- 12	7	- 1/8	-1.7
O	COGNITRONICS	2- 20	8 1/8	+ 5/8	+8.3

EXCH		1983-84 RANGE (1)	CLOSE APR 18 1984	WEEK NET CHNGE	WEEK PCT CHNGE
O	COMPUTER DEVICES INC	0- 21	3/4	0	0.0
O	COMPUTER TRANSCEIVER	3- 12	3/4	0	0.0
N	COMPUTERVISION CORP	19- 53	32 3/8	+2 1/2	+8.3
N	CONRAC CORP	14- 38	16 3/8	- 3/4	-4.3
A	DATAPRODUCTS CORP	16- 41	21 3/4	- 1/2	-2.2
A	DATARAM CORP	5- 12	9 5/8	+ 1/4	+2.6
O	DATA SWITCH CORP	13- 41	15	-1	-6.2
O	DATUM INC	2- 17	6 3/4	- 1/4	-3.5
O	DECISION DATA COMPUT	3- 16	9 1/2	0	0.0
O	DOCUTEL-OLIVETTI	7- 39	8 5/8	+1 1/4	+16.9
N	ELECTRONIC M & M	5- 11	7 5/8	+1 1/2	+24.4
O	ENDATA, INC	9- 16	9 1/2	- 3/4	-7.3
O	EVANS & SUTHERLAND	17- 50	17 1/2	+1	+6.0
O	GANDALF TECHNOLOGIES	9- 22	10 1/8	- 3/8	-3.5
N	GEN'L DATA COMM IND	6- 33	25 3/4	- 7/8	-3.2
O	GREAT SOUTHWEST IND	1- 6	7/8	0	0.0
N	HAZELTINE CORP	7- 31	25 1/2	+ 3/8	+1.4
O	ICOT CORP	3- 10	3 3/4	+ 1/8	+3.4
O	INFORMATION INTL INC	10- 22	12	0	0.0
O	INFORMATION SCIENCE	8- 17	8	0	0.0
O	INTEL CORP	11- 45	33	0	0.0
O	IPL SYSTEMS INC	4- 14	4 1/4	- 1/4	-5.5
A	LUNOY ELECTRONICS	7- 19	11	+1 1/8	+11.3
O	MEGADATA CORP	9- 15	9 1/4	0	0.0
A	MSI DATA CORP	16- 37	17 1/2	+1	+6.0
N	NASHUA CORP	9- 29	25 1/2	+1 5/8	+6.8
O	NETWORK SYSTEMS CORP	8- 34	18 5/8	+1 5/8	+9.5
N	NO AMERICAN PHILIPS	17- 40	33 3/4	+1 1/4	+3.8
N	NORTHERN TELECOM LTD	22- 49	31 3/8	- 1/2	-1.5
O	OMEX	1- 6	1/4	0	0.0
N	PARADYNE CORP	13- 30	15 1/8	- 1/4	-1.6
A	PENRIL CORP	7- 14	11 3/8	0	0.0
O	PHOENIX AMERICAN INC	7- 17	8	0	0.0
N	PLESSEY CO (ADR)	26- 41	32 1/2	-1 1/2	-4.4
O	PRINTRONIX INC	20- 34	20 1/2	-1	-4.6
O	RAMTEK CORP	9- 26	8 3/4	0	0.0
N	RAYTHEON CO	36- 58	38 7/8	+2 3/8	+6.5
N	RECOGNITION EQUIP	4- 17	14	+ 1/8	+0.9
N	ROLM CORP	30- 80	30 3/8	-2 3/8	-7.2
N	SANDERS ASSOCIATES	36-120	40 1/2	+2 1/4	+5.8
O	SCAN DATA	1- 3	3/8	0	0.0
O	SCAN-TRON CORP	12- 19	13 1/2	- 1/2	-3.5
N	SCIENTIFIC ATLANTA	9- 23	10	0	0.0
N	STORAGE TECHNOLOGY	9- 33	8 1/2	-1	-10.5
O	SYKES DATATRONICS	3- 27	3 1/4	+ 1/4	+8.3
O	SYSTEMS & COMP TECH	20- 39	22 1/2	+1 1/2	+7.1
A	T BAR INC	7- 17	10 1/4	+1 3/8	+15.4
A	TAB PRODUCTS CO	5- 20	16	+ 1/8	+0.7
O	TANDON CORP	10- 35	10	+ 1/2	+5.2
A	TEC INC	6- 12	10 7/8	+1	+10.1
N	TEKTRONIX INC	34- 87	63	+1 3/4	+2.8
N	TELEX	5- 32	21 1/4	+1 1/4	+8.2
O	TESDATA SYSTEMS CP	3- 17	5 1/4	- 3/8	-6.6
N	TIMEPLEX INC	7- 29	14 3/4	+ 1/8	+0.8
O	VISUAL TECHNOLOGY	9- 26	12 1/8	+ 3/8	+3.1
	SUPPLIES & ACCESSORIES				
N	AMERICAN BUS PRODS	7- 23	20	+ 3/8	+1.9
N	BARRY WRIGHT	13- 33	24 7/8	+1 1/2	+6.4
A	DUPLEX PRODUCTS INC	12- 27	24 1/2	+ 3/4	+3.1
N	ENNIS BUS. FORMS	6- 28	19	+ 1/2	+2.7
N	3M COMPANY	49- 90	72	+ 7/8	+1.2
N	MOORE CORP LTD	26- 51	35 3/8	- 1/4	-0.7
O	STANDARD REGISTER	11- 34	32 1/4	+ 1/4	+0.7
N	WALLACE BUS FORMS	11- 33	26 7/8	+1 1/2	+5.9

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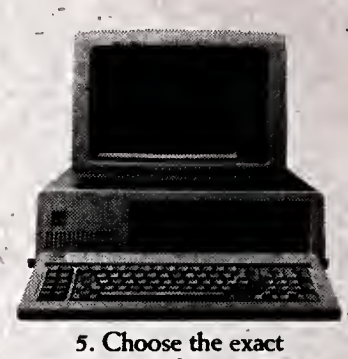

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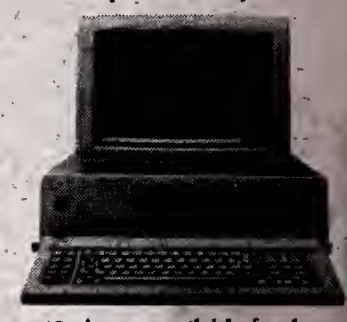
15. Make a purchase order adjustment without leaving your workstation.

16. Download current balances from General Ledger to graph actual vs. planned.

17. Capture data from MSA's Fixed Assets System, use PeachCalc™ to create a lease amortization model.



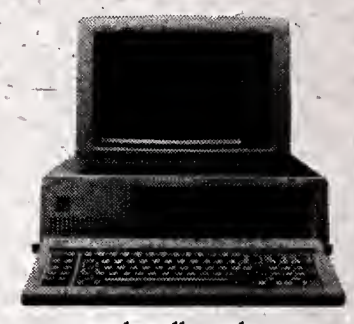
18. Access available funds data in MSA's Budgetary Control System...

19. Use PeachCalc™ to project expenditure through year-end.

20. Use MSA's Manufacturing System data to produce cost/margin analysis with PeachCalc.™

21. Dial up subscriber databases to access current credit information for customers...

22. Use PeachCalc™ to analyze information, set credit and update your mainframe Accounts Receivable data.



23. Install it in less than one hour.

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24. -100.

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